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TRADE NAME	MODEL	SET AND FOLDER No.
Airline	05GSE-3020A, B, C, 05GSE-3042A Tel. Rec. Prod. Chg. Bul. 36	166-1
Airline	15GHM-935	166-3
Altec Lansing	303A	166-4
Ampro	731	166-5
Arvin	5210, 5211, 5212 (Ch. TE315, -1, -2, -3, -4, -5) Tel. Rec. Prod. Chg. Bul. 37	166-2
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Capehart	10 (Ch. C-312)	166-7
David Bogen	DP-16	166-8
Emerson	700D, 701D (Ch. 120158-B) Tel. Rec.	166-9
General Electric	17C113, 17C115, 17C120 Tel. Rec.	166-10
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Majestic	143, 173, 1700C, 1710C, 1720, 1721 Tel. Rec. Prod. Chg. Bul. 37	166-2
Sparton	5165X, 5166X, 5175X, 5178X (Ch. 26SD171) Tel. Rec.	166-13
Stewart-Warner	9203-A Tel. Rec.	166-14
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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 117.

Airline Models 05GSE-3020A, 3020B, 3020C and -3042A are covered by Photofact Folder 3 in Set 117.

The table given below shows the difference in component values used in the four Models.

MODEL 05GSE - 3020A		MODEL 05GSE - 3020B		MODEL 05GSE - 3020C 05GSE - 3042A	
C68	.005MFD	C68	Not used		
C69	.05MFD	C69	.01MFD		
C10	100MFD	C10	Not used		
C65	.003MFD	C65	.005MFD		
C78	.1MFD	C78	.01MFD		
C9A	10MFD	C9A	Not used		
C9B	15MFD	C9B	Not used		
C58	.005MFD	C58	.005MFD		
		C68	.002MFD	C68	.02MFD
		C67	.002MFD	C67	.02MFD
		C82	.05MFD		
R24	10Ω	R24	Not used		
R52	180K	R52	150K		
R74	100K	R74	470K		
R77	470K	R77	Not used		
R75	100K	R75	470K		
R80	1500Ω	R80	1200Ω	R80	1500Ω
R84	10K	R84	8200Ω		
R87	68Ω	R87	Not used		
R89	15K	R89	27K	R89	30K
R83	220K	R83	270K	Additional component differences for Models 05GSE-3020C, -3042A.	
R85	560K	R85	1Meg		
R91	4700Ω	R91	Not used	R58	Not used
R92	2200Ω	R92	Not used	R59	8200Ω
R93	15K	R93	Not used	R68	6800Ω
		R74	33K	R70	3300Ω
		R75	33K	R90	30K
		R56	150Ω		
L22	20E639	L22	MW20E639	L22	MW20E639
L23	Not used	L23	MW2E92	L23	MW2E92
T3	22E57-3	T3	MW22E57-3	T3	MW22E57-3

AIR LINE MODELS 05GSE - 3020A, 05GSE - 3020B, 05GSE - 3020C, 05GSE - 3042A

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DENVER, COLORADO

PRODUCTION CHANGES
BULLETIN 36

PRODUCTION CHANGES
BULLETIN 36

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 151

Ch. TE315	Arvin Models 5210, 5211, 5212 (Ch. TE315) were covered in Photofact Folder 5 in Set 151.
Ch. TE315-1	Arvin Chassis TE 315-1 differs from Chassis TE 315 as follows: The picture tube is mounted in the cabinet to permit easier centering of the tube in the cabinet bezel and to reduce the hazard of handling the tube. R113 was removed and three 220KΩ Resistors in series were added in place of R113. A polyethelene sleeve covers the resistors to prevent airing. This change was made to prevent high voltage leakage at the 1B3 tube socket.
Ch. TE315-2	In Chassis TE 315-2 R105 was changed to 47K to increase the range of the horizontal hold control and minimize the chances of the oscillator drifting beyond the range of the front panel control. The following procedure should be employed for adjusting the horizontal hold control: 1. Turn the control full clockwise and then back counter-clockwise 90%. 2. Adjust the horizontal lock until the picture is in sync. Then turn the adjustment clockwise until the picture goes out of sync. Next turn the lock screw counter clockwise until the picture just pulls into sync. Note: To check the above adjustment set the horizontal hold control in full counter clockwise position. Switch the channel selector off station then on again. The picture should go out of sync. Repeat this for the clockwise setting of the hold control. C29 was changed to 8.2MMF. This results in greater sound gain and better quieting at the discriminator. This also changes the tuning of the top slug of L10. When realignment of L10 is required a television sweep generator should be employed as per instructions in Folder 5 in Set 151. To reduce tweet or squeal in the sound, a 5000MMF capacitor was added from Pin 7 of V9 to ground. The RF tuner assembly was changed to AE24737-3.
Ch. TE 315-3	Chassis TE 315-3 differs from TE 315-2 in that an IF trap Part # C25255 is added. The antenna lead is cut about four inches from the tuner and connected to the four terminals of the trap. This trap is designed as a high pass filter to eliminate interference below 45MC.
Ch. TE 315-4	In Chassis TE 315-4 the 5000 MMF capacitor between Pin 7 of V9 to ground was removed. A 1500Ω resistor was added in series with the -13V bias line feeding the suppressor and control grid of V8 A .1MFD capacitor was added in parallel with R114.
Ch. TE 315-5	In Chassis TE 315-5 a vertical retrace blanking circuit was added. B+ was removed from the red lead of T4 and connected to the green lead of T4. A .022MFD capacitor was added from the green to red leads of T4. A 220KΩ Resistor was added from the grid of the picture tube to the arm of the brightness control. Two .1MFD capacitors are connected in series between the picture tube grid and the red lead of T4. An 8200Ω Resistor was connected from the junction of the two .1MFD capacitors to ground.

ARVIN MODELS 5210, 5211, 5212 (Ch. TE 315, -1, -2, -3, -4, -5)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 127

The following Majestic Models have been added to the group of Models 17DA, GA, HA etc. covered in Photofact Folder 7 in Set 127: Models 143, 173, 1700C, 1701C, 1720, 1721.

Production changes on the Series 99 to 105 receivers are as follows:

On Receivers using Sarkes Tarzian tuner a 5000MMF capacitor was added from the AGC lead to ground at the tuner terminal strip.

In some receivers V3 and V4 were changed to type 6CB6 tubes. The cathode resistors R19 and R22 were removed. The cathode resistors were replaced with 47Ω units and connected between Pin 2 and ground of each tube socket. Pin 7 of V3 and V4 were grounded.

In some sets C65 was changed to 30MMF part #B-4 . 129-2 and R91 was changed to 220KΩ.

In some sets R68 was changed to a 1Meg Resistor.

MAJESTIC MODELS 143, 173, 1700C, 1710C, 1720, 1721

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AIRLINE
MODEL 15GHM-935

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

AIRLINE
MODEL 15GHM-935

AIRLINE
MODEL 15GHM-935

TRADE NAME	Airline Model 15GHM-935
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Audio Amp. with 3 speed Manual Record Player
TUBES (TWO)	Types 12AV6 AF Amp., 50B5 Audio Output
POWER SUPPLY	110-120 Volts AC — RATING .45 Amp. @ 117 Volts AC (with motor)

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL 15GHM-935

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRLINE PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AV6	12AV6	7BT	
V2	Audio Output	50B5	50B5	7BZ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	150		PRS150/50-30-20		EZ44315C		TVA-3430	Filter (Red)
B	20	150		PRS25/25 †				TVA-1410 †	Filter (Blue)
C	20	25							Not Used (Green)
C2	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C3	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C4	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Output Plate
C5	.1	200		P288-1	DF-104	PJ2P1		2TM-P1	Tone Comp.
C6	.1	200		P288-1	DF-104	PJ2P1		2TM-P1	Line Isolation

† Not needed in some Models

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	250KΩ	½	1013	Q13-130	AG-64-Z	AN-51	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions
R2A	25KΩ	½	1018	Q11-120	AG-40-S	AN-26	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions

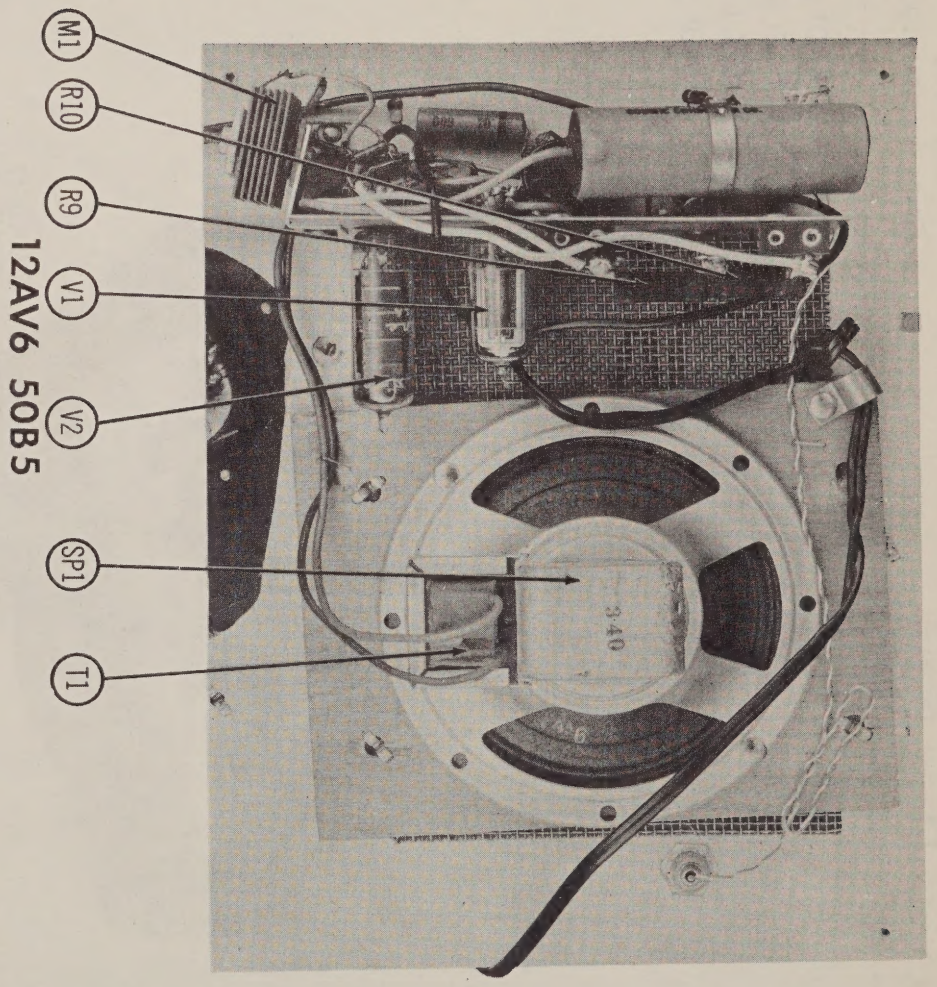
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	
R3	500KΩ	½			Tone Compensation
R4	5Meg	½			AF Amp. Grid
R5	250KΩ	½			AF Amp. Plate
R6	470KΩ	½	1019	BTS-470K	Output Grid
R7	220Ω	1		BTA-220	Output Cathode
R8	2200Ω	½		BTS-2200	Filter
R9	200Ω	5	1017	1 3/4A-200	Filament Dropping - Wire Wound
R10	200Ω	5	1017	1 3/4A-200	Filament Dropping - Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2KΩ	3.4Ω	160Ω	.5Ω	Part of 1006	A-3332 ①	A-3025 ①		① Bend Mounting Tabs Down, File out Slots and Mount on Original Bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.4Ω	1006	ST-105 Mod. P5-X	5A1	
	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT	AIRLINE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	
M1	.053A.		NB-5	5M4	1003A	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	AIRLINE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	1002					16-0 2300 *	0-13	* Tone Arm Complete

ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

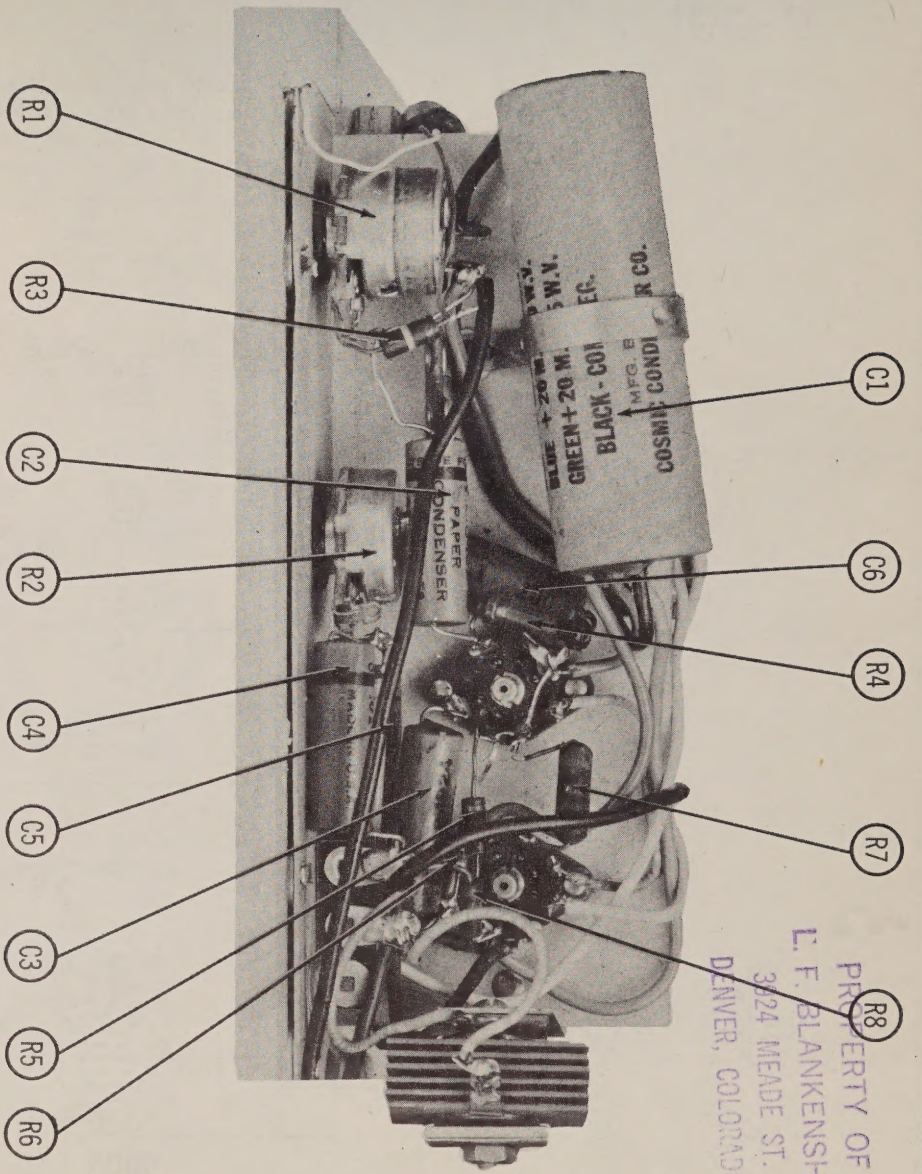
FORM No. 31-

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	AIRLINE PART No.	WALCO PART No.	JENSEN PART No.	
M3	1004	W-22TPA or W-22TPS	E-91 or E-93	

CHASSIS—BOTTOM VIEW



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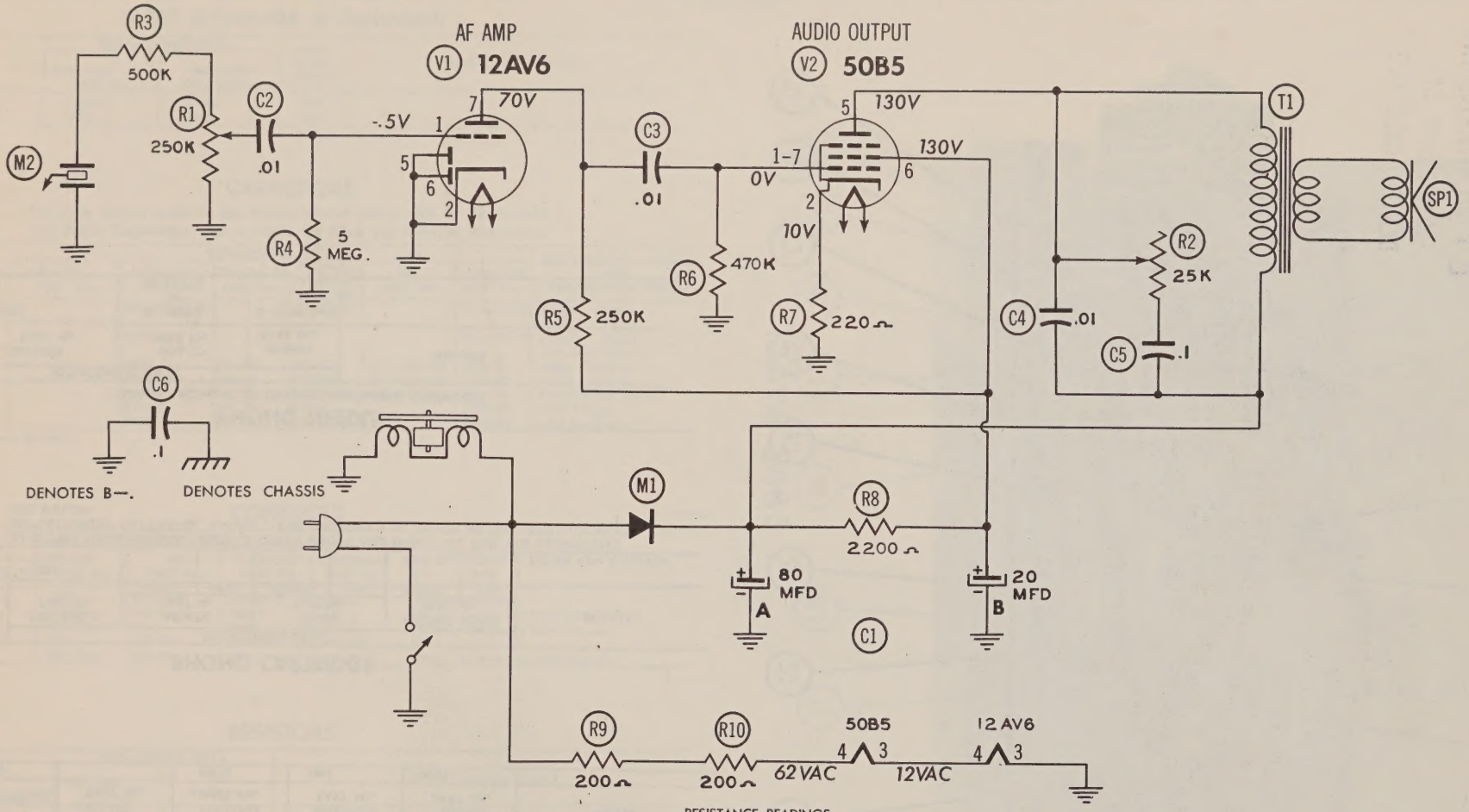

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AV6	5Meg	0Ω	0Ω	12Ω	0Ω	0Ω	†250KΩ
V 2	50B5	470KΩ	220Ω	12Ω	62Ω	†160Ω	†2.2KΩ	470KΩ

† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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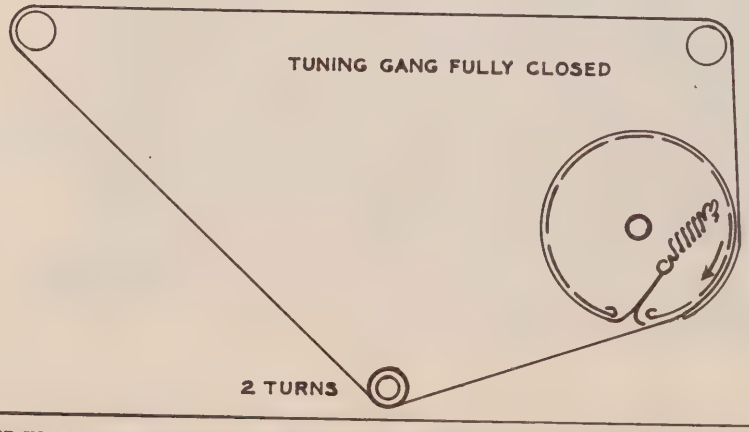
166-3

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Proper output load connected.

ALTEC LANSING
MODEL 303A

ALTEC LANSING
MODEL 303A

TRADE NAME	Altec Lansing Model 303A
MANUFACTURER	Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.
TYPE SET	AC Operated AM-FM Superheterodyne Tuner
TUBES (Fourteen)	Types (2) 6C4 FM RF Amp., 12AT7 FM Conv., 6BAG 1st FM IF Amp., 6BA6 2nd FM IF Amp., 6AL5 Ratio Det., 6BA6 AM RF Amp., 6BE6 AM Conv., 6BA6 AM IF Amp., 6AL5 AM Det-AVC, 6U5 or 6G5 Tuning Ind., 12AX7 Phono Pre Amp.-AF Amp., 12AU7 Phase Inv., 6X4 Rect.
POWER SUPPLY	110-120 Volts AC RATING .59 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC FREQ. MOD. 88-108MC



THIS UNIT MAY BE USED IN CONJUNCTION WITH REMOTE AMPLIFIER A-433A AND POWER AMPLIFIER A-333A COVERED IN PHOTOFACT SET 165 - FOLDER 5.

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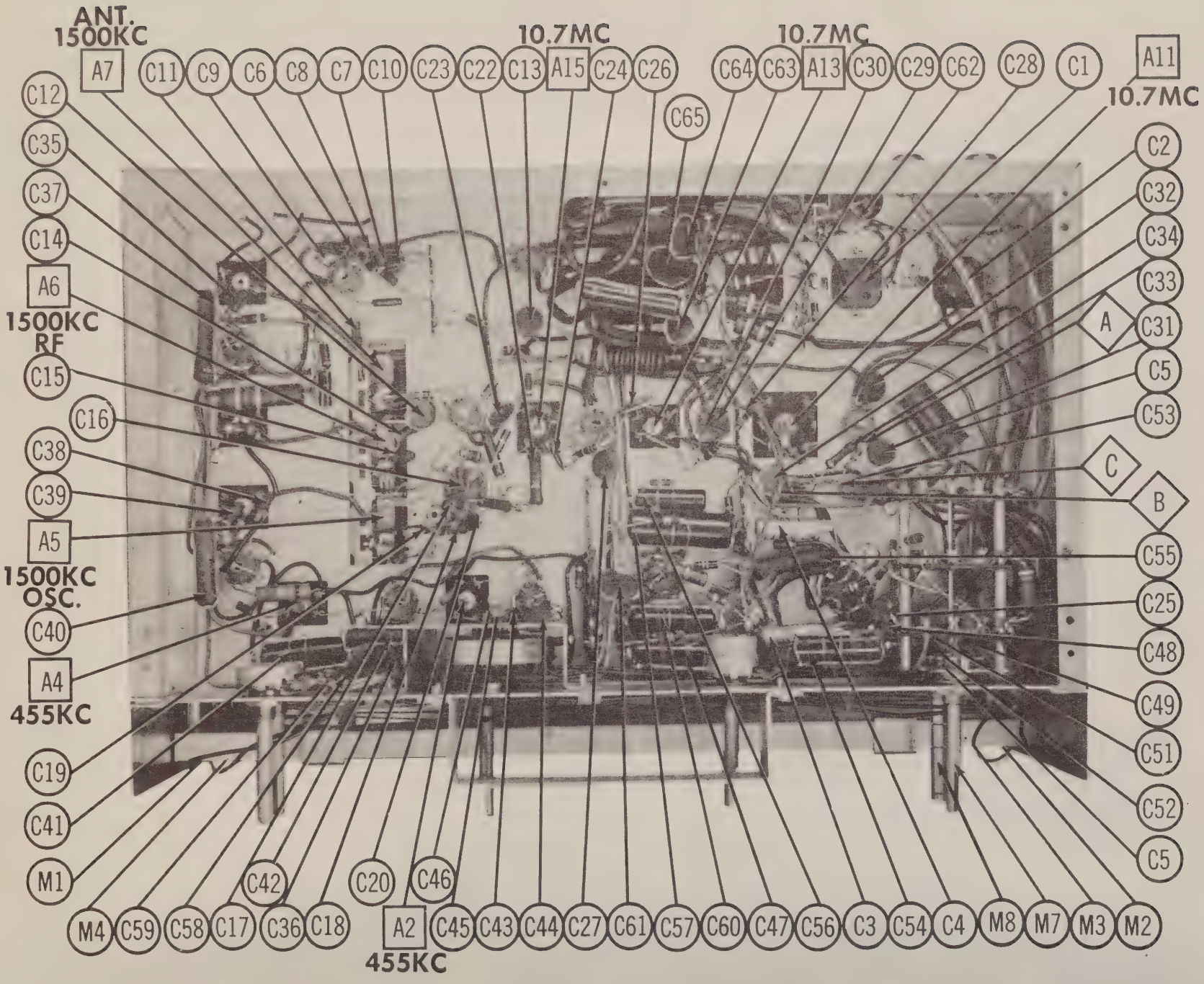
ANT.
1500KC
A7
C11
C9
C6
C8
C7
C10
C23
C22
C13
10.7MC
A15
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C65
C64
C63
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A13
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C62
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10.7MC
C12
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C14
A6
1500KC
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C16
C38
C39
A5
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C40
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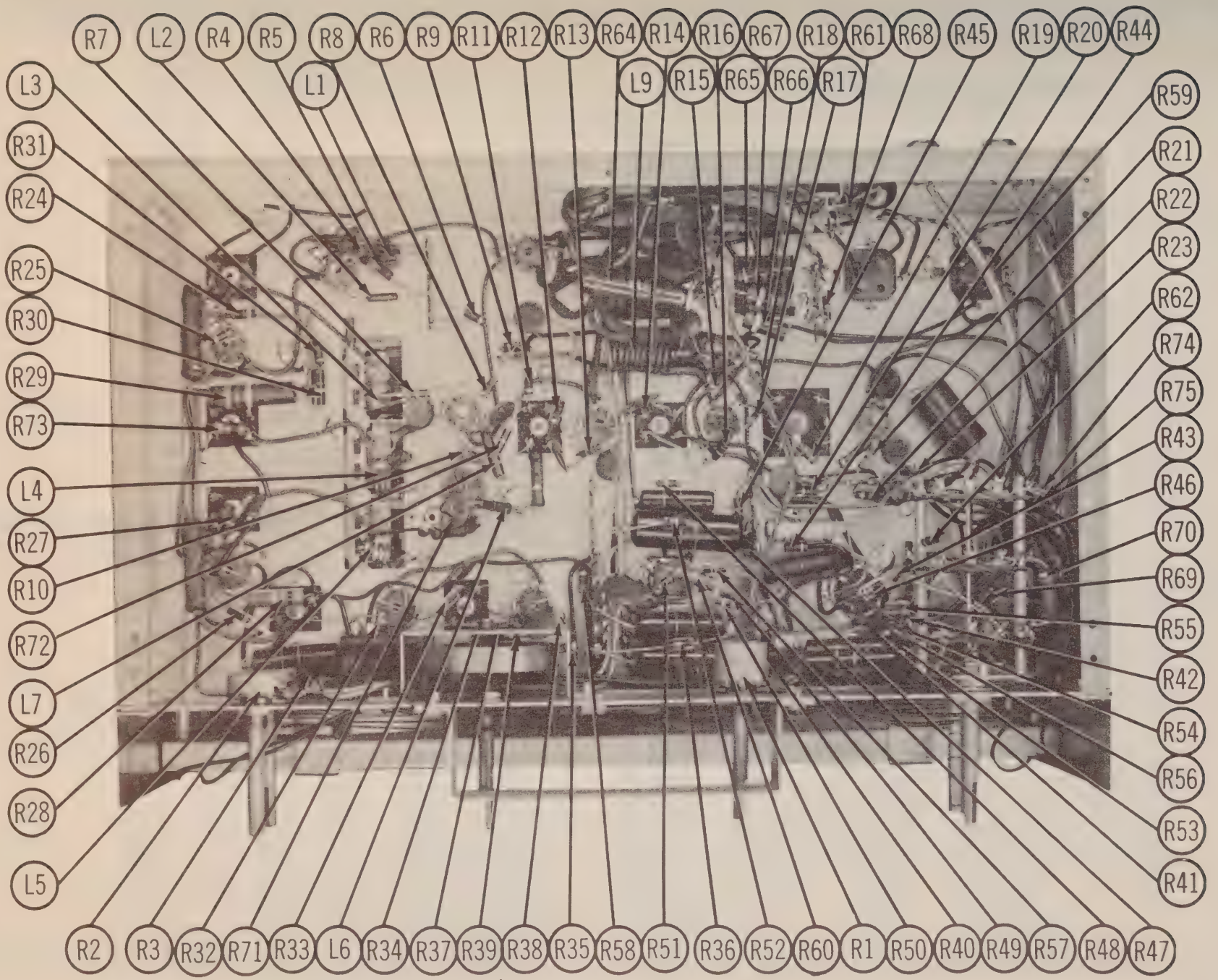
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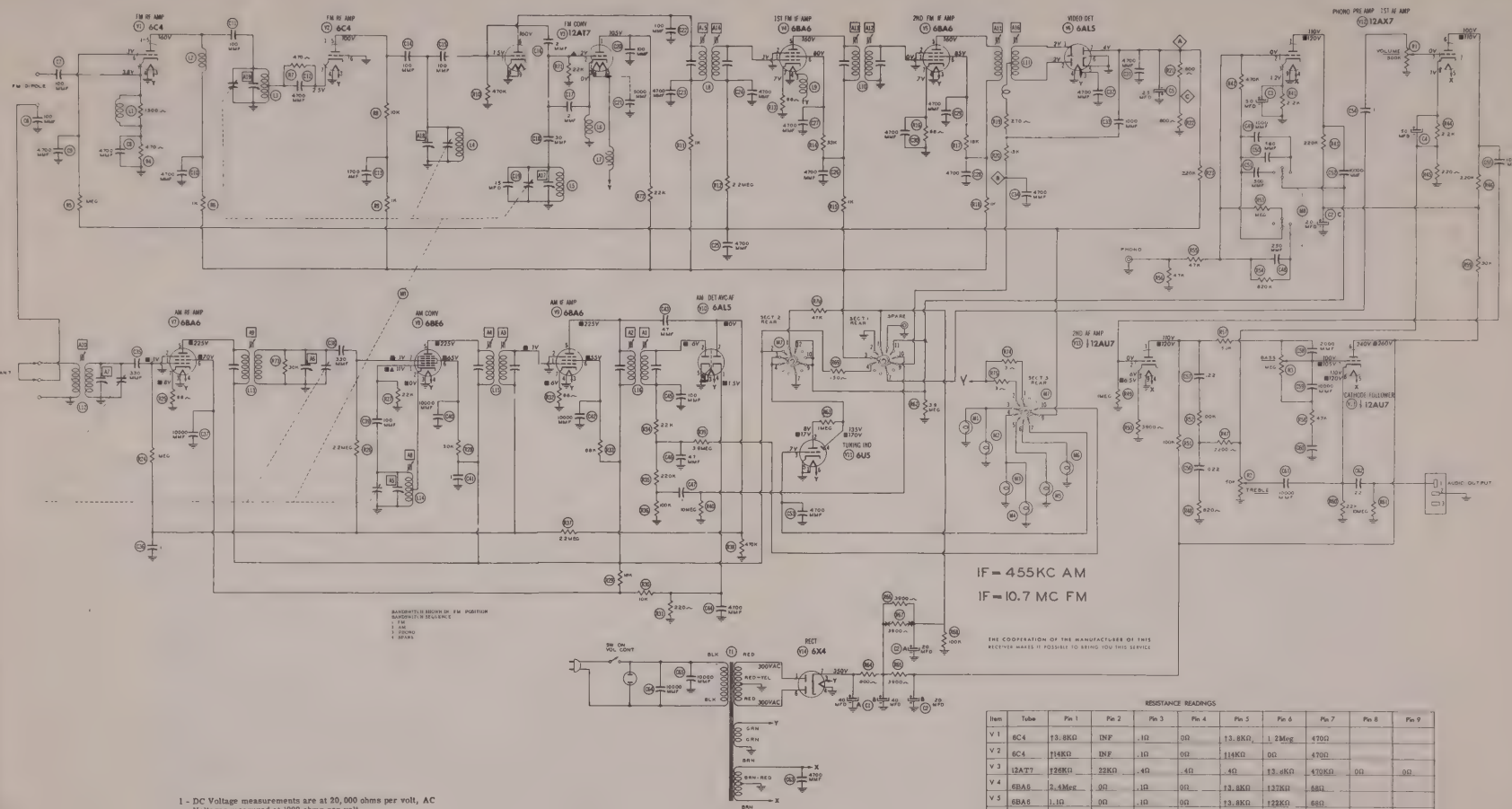
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FM RF AMP V2 6C4
FM CONV V3 12AT7
1ST FM IF AMP V4 6BA6
2ND FM IF AMP V5 6BA6
VIDEO DET V6 6AL5
PHONO PRE AMP 1ST AF AMP V13 12AX7
AM RF AMP V7 6BA6
AM CONV V8 6BE6
AM IF AMP V9 6BA6
AM DET AVC-AF V10 6AL5
2ND AF AMP V12 12AU7
CATHODE-FOLLOWER V11 12AU7
TUNING IND V11 6U5
RECT 6X4
SECT 2 REAR
SECT 1 REAR
SECT 3 REAR
SPARE
FM DIPOLE
ANT
PHONO
VOLUME
TREBLE
AUDIO OUTPUT
SW ON VOL CONT
300VAC
IF = 455KC AM
IF = 10.7 MC FM
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6C4	†3.8KΩ	INF	.1Ω	0Ω	13.8KΩ	1.2Meg	470Ω		
V 2	6C4	†14KΩ	INF	.1Ω	0Ω	14KΩ	0Ω	470Ω		
V 3	12AT7	†26KΩ	22KΩ	.4Ω	.4Ω	.4Ω	13.6KΩ	470KΩ	0Ω	0Ω
V 4	6BA6	2.4Meg	0Ω	.1Ω	0Ω	13.8KΩ	†27KΩ	68Ω		
V 5	6BA6	1.1Ω	0Ω	.1Ω	0Ω	13.8KΩ	†22KΩ	68Ω		
V 6	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	3.6KΩ		
V 7	6BA6	3.7Meg	0Ω	0Ω	.1Ω	†3KΩ	8KΩ	68Ω		
V 8	6BE6	22KΩ	.5Ω	0Ω	.1Ω	†3KΩ	†33KΩ	4.9Meg		
V 9	6BA6	2.7Meg	0Ω	.1Ω	0Ω	†3KΩ	†7KΩ	68Ω		
V 10	6AL5	220Ω	340KΩ	0Ω	.1Ω	0Ω	0Ω	470KΩ		
V 11	6U5	0Ω	†1Meg	220KΩ 4.2Meg	†50KΩ	0Ω	.1Ω			
V 12	12AX7	†250KΩ	95KΩ	2.2KΩ	1.6Ω	1.6Ω	†250KΩ	30Ω	2.4KΩ	10Ω
V 13	12AU7	†100KΩ	1Meg	3.9KΩ	1.6Ω	1.6Ω	†4.6KΩ	1Meg	22KΩ	10Ω
V 14	6X4	220Ω	INF	.1Ω	0Ω	INF	220Ω	40KΩ		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS NOTED:
†MEASURED FROM PIN 7 OF V 14.
*MEASURED IN "AM" POSITION.
‡MEASURED FROM PIN 9 OF V 12.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

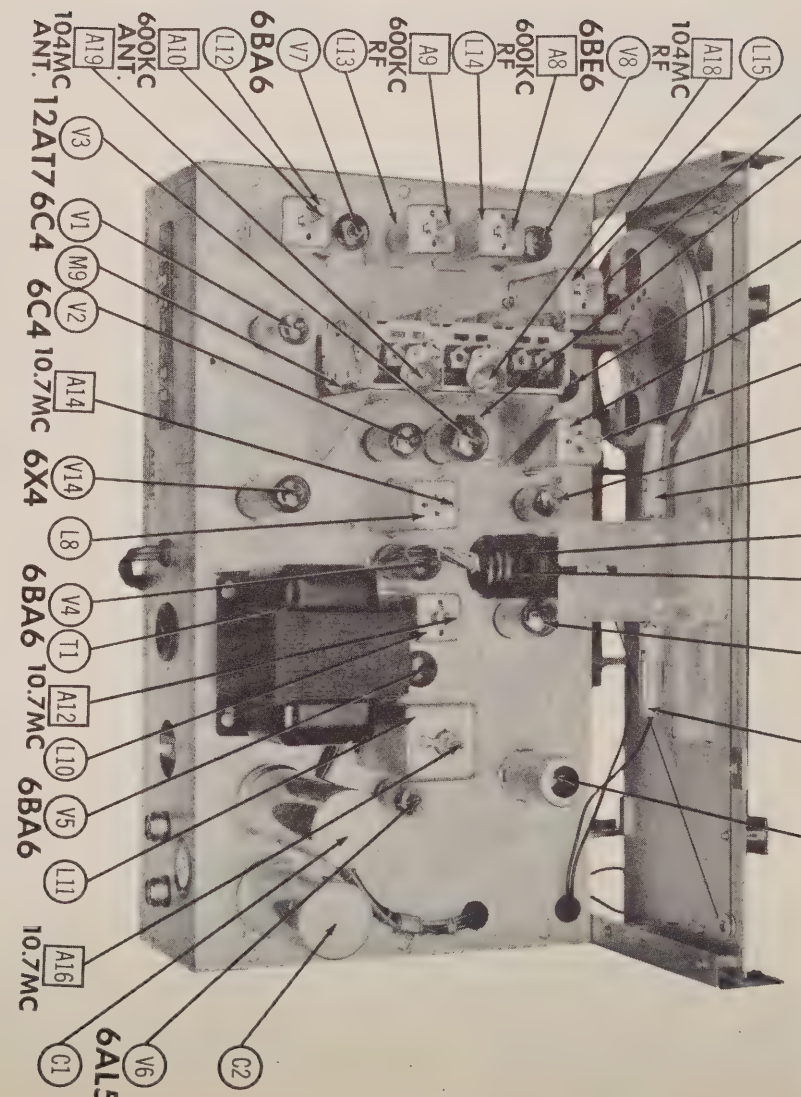
ITEM No.	USE	REPLACEMENT DATA: ALTEC LANSING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	1st FM RF Amp.	6C4	6C4	6BG	
V2	2nd FM RF Amp.	6C4	6C4	6BG	
V3	FM Converter	12AT7	12AT7	9A	
V4	1st FM IF Amp.	6BA6	6BA6	7BK	
V5	2nd FM IF Amp.	6BA6	6BA6	7BK	
V6	Ratio Detector	6AL5	6AL5	6BT	
V7	AM RF Amp.	6BA6	6BA6	7BK	
V8	AM Converter	6BE6	6BE6	7CH	
V9	AM IF Amp.	6BA6	6BA6	7BK	
V10	Dector - AVC	6AL5	6AL5	6BT	
V11	Tuning Indicator	6U5/6G5	6U5/6G5	6R	
V12	Phono. Pre Amp. 1st AF Amp.	12AX7	12AX7	9X	
V13	2nd AF Amp. - Cathode Follower	12AU7	12AU7	9A	
V14	Rectifier	6X4	6X4	5BS	

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Atec Lansing PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475		AFH2-72		UP4450		TVL-2830	▲ Filter
B	40	475							■Filter
C2A	20	450		AFH4-14		UPT222245		TVL-4763	■ Decoupling
B	20	450							▲ Decoupling
C	20	450							Decoupling
D	20	450							▲ Not used
C3	50	3		PRS25/50		BBR50-3		TVA-1100	Phono Pre Amp. Cathode
C4	50	3		PRS25/50		BBR50-3		TVA-1100	1st AF Amp. Cathode
C5	25	25		PRS25/25		BR252A		TVA-1205	Stabilizing Cap.
C6	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	FM Ant. Isolation
C7	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	FM RF Coupling
C8	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	1st FM RF Amp. Cathode
C9	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	AVC Filter
C10	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	1st FM RF Amp. Dec.
C11	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	FM RF Coupling
C12	4700			BPD-005	DD-502	TM5D5	811-005	5HK- D47	FM RF Coupling
C13	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	2nd FM RF Amp. Dec.
C14	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	FM RF Coupling
C15	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	FM RF Coupling
C16	2						N750K-020		FM Osc. Coupling
C17	2						N750K-020		FM Osc. Feedback
C18	30				TCZ-30		NP0K-300		FM Osc. Grid Cap.
C19	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Trimmer
C20	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	FM Osc. Plate Bypass
C21	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	FM Conv. Fil. Bypass *
C22	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Fixed Trimmer
C23	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	FM Mixer Plate Dec.
C24	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	AVC Filter
C25	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	AVC Filter
C26	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	1st FM IF Amp. Plate
C27	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	1st FM IF Amp. Screen
C28	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	2nd FM IF Amp. Plate
C29	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	2nd FM IF Amp. Screen
C30	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	2nd FM IF Amp. Cathode
C31	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	RF Bypass
C32	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	Ratio Det. Fil.
C33	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Diode Load Cap.
C34	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	De-Emphasis
C35	330			SI330	D6-331		GP2K-331	5GA-T33	AM RF Coupling
C36	)	400		P488-1	DF-104	PTE4P1		4TM-P1	AVC Filter
C37	10000			SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	AM RF Amp. Screen
C38	330			SI330	D6-331		GP2K-331	5GA-T33	AM RF Coupling
C39	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	AM Osc. Grid Cap.
C40	10000			SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	AM Osc. Anode Bypass
C41	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	AM Conv. Plate Dec.
C42	10000			SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	AM IF Amp. Screen
C43	47			SI47	D6-470	TM5Q5	GP1K-470	5GA-Q47	IF Coupling
C44	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	AVC Filter
C45	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Diode RF Filter
C46	47			SI47	D6-470	TM5Q5	GP1K-470	5GA-Q47	Diode RF Filter
C47	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Audio Coupling
C48	250			SI250	D6-251	5W5T25	GP2K-251	1FM-325	Tone Comp.
C49	1000			SI1000	D6-102	TM5D1	GP26-102	5HK-D1	Tone Comp.

SET 166
FOLDER 4

CHASSIS—TOP VIEW



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DENVER, COLO

PARTS LIST AND DESCRIPTIONS (Continued)

C50	560			SI560	D6-561		GP2K-561		Tone Comp.
C51	1500			SI1500	D6-152	TM5D15	GP26-152	5HK-D15	Tone Comp.
C52	10000			SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C53	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	Tuning Ind. Filter
C54	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Audio Coupling
C55	10000			SI10000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C56	.022	400		P488-022		PTE4S22		4TM-S22	Tone Comp.
C57	.22	400		P488-22		PTE4P22		4TM-P22	Tone Comp.
C58	2000	500		1467-002	D6-202	1W5D2	GP2-333-202	1FM-22	Tone Comp.
C59	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Tone Comp.
C60	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Tone Comp.
C61	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Audio Coupling
C62	.22	400		P488-22		PTE4P22		4TM-P22	Audio Coupling
C63	4700			BPD-005	DD-502	TM5D5	811-005	5HK-D47	Fil. Bypass
C64	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Line Filter
C65	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Line Filter

* Not used in all models.
+ Some models use 10000MMF in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ALTEC LANSING PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO.	
R1A	500KΩ	½		Q13-133	AG-60-Z	B-60-S	Volume Control.
B	Shaft			Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch			76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	50KΩ	½		Q11-123	AG-44-S	B-31	Treble Control
B	Shaft			Not Req.	FS-3	Not Req.	Attach to R2A per instructions
R3A	1Meg	½		Q13-137	AG-63-Z	B-70	Bass Control
B	Shaft			Not Req	FS-3	Not Req.	Attach to R3A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ALTEC LANSING PART No.	IRC PART No.	
R4	470Ω	½		BTS-470	FM-RF Amp. Cathode
R5	1Meg	½			AVC Net
R6	1000Ω	½		BTS-1000	FM RF Amp. Decoupling
R7	470Ω	½		BTS-470	FM RF Amp. Cathode
R8	10KΩ	½			FM RF Amp. Plate
R9	1000Ω	½		BTS-1000	FM RF Amp. Decoupling
R10	470KΩ	½			FM Mixer grid
R11	1000Ω	½		BTS-1000	FM Mixer decoupling
R12	2.2 Meg	½			1st FM IF Amp grid
R13	68Ω	½			AVC Net
R14	33KΩ	½			1st FM IF Amp. Screen
R15	1000Ω	½		BTS-1000	1st FM IF Amp. Decoupling
R16	68Ω	½			2nd FM IF Amp. Cathode
R17	18KΩ	½			2nd FM IF Amp. Screen
R18	1000Ω	½		BTS-1000	2nd FM IF Amp. Decoupling
R19	270Ω	½			Balancing
R20	15KΩ	½			De-Emphasis
R21	1800Ω	½		BTS-1800	Ratio Det. Diode Load
R22	1800Ω	½		BTS-1800	Ratio Det. Diode Load
R23	220KΩ	½		BTS-220K	AVC Network
R24	1Meg	½			AM RF Amp. Grid
R25	68Ω	½			AM RF Amp. Cathode
R26	2.2Meg.	½			Mixer Grid
R27	22KΩ	½			Osc. Grid
R28	30KΩ	1			AM Converter Screen
R29	18KΩ	2			AM RF Amp. Screen
R30	10KΩ	1			Voltage Divider
R31	220Ω	½		BTS-220	Voltage Divider
R32	68Ω	½			AM IF Amp. Cathode
R33	68KΩ	½		BTS-68K	AM IF Amp. Screen
R34	22KΩ	½		BTS-22K	Diode Filter
R35	220KΩ	½		BTS-220K	Diode Det. Plate Load
R36	100KΩ	½		BTS-100K	Diode Det Plate Load
R37	2.2Meg.	½		BTS-2.2Meg	AVC Network
R38	470KΩ	½		BTS-470K	AVC Network
R39	3.9Meg	½		BTS-3.9Meg	Indicator Network
R40	10Meg	½		BTS-10Meg	Tone Compensation
R41	2.2KΩ	½		BTS-2.2K	Phono Pre Amp. Cathode
R42	470KΩ	½		BTS-470K	Phono Pre Amp. Grid
R43	220KΩ	½		BTS-220K	Phono Pre Amp. Plate
R44	2.2KΩ	½		BTS-2.2K	AF Amp. Cathode
R45	220Ω	½		BTS-220	AF Amp. Cathode
R46	220KΩ	½		BTS-220K	AF Amp. Plate
R47	2200Ω	½		BTS-2200	Tone Compensation
R48	820Ω	½		BTS-820	Tone Compensation
R49	1Meg	½		BTS-1Meg	2nd RF Amp. Grid

PARTS LIST AND DESCRIPTIONS (Continued)

R50	3900Ω	½		BTS-3900	2nd AF Amp. Cathode
R51	100KΩ	½		BTS-100K	2nd AF Amp. Plate
R52	100KΩ	½		BTS-100K	Tone Compensation
R53	1Meg	½		BTS-1Meg	Tone Compensation
R54	820KΩ	½		BTS-820K	Tone Compensation
R55	47KΩ	½		BTS-47K	Tone Compensation
R56	47KΩ	½		BTS-47K	Phono Shunt
R57	150KΩ	½		BTS-150K	Tone Compensation
R58	47KΩ	½		BTS-47K	Tone Compensation
R59	30KΩ	½		BTS-30K	Decoupling
R60	22KΩ	1		BTA-22K	Cathode Follower Load
R61	10Meg	½		BTS-10Meg	Output Shunt
R62	3.9 Meg	½		BTS-3.9Meg	Tone Compensation
R63	1Meg	½		BTS-1Meg	Tuning Indicator Plate
R64	800Ω	5		1 3/4A-800	Filter - Wire Wound
R65	3900Ω	1		BTA-3900	Filter
R66	3900Ω	2		BTB-3900	Filter - See Note 1
R67	3900Ω	2		BTB-3900	Filter - See Note 2
R68	100KΩ	½		BTS-100K	Bleeder
R69	150Ω	½		BTS-150	Decoupling
R70	47KΩ	½		BTS-47K	Voltage Divider
R71	22KΩ	½			FM Osc. Grid
R72	22KΩ	½			FM Osc. Plate
R73	30KΩ	½		BTS-30K	RF Coil Shunt - See Note 2
R74	3Ω	½			Series Pilot Light - See Note 2
R75	3Ω	½			Series Pilot Light - See Note 2

Note 1. Some models use a 2000Ω resistor in this application.
Note 2. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	ALTEC LANSING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② .57A	600VCT .060ADC	6.3VAC ③ 4.2A	6.3VCT ④ .6A				

COILS (RF-IF)

TEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ALTEC LANSING PART No.	MERIT PART No.	
L1	FM Ant. Choke	.1Ω				Wound on 1.5KΩ Resistor
L2	Plate Choke	1.1Ω				
L3	1st. FM RF Coil	0Ω				
L4	2nd. FM RF Coil	0Ω				
L5	FM Osc. Coil	0Ω				
L6	Cath. Choke	.4Ω				
L7	Fil. Choke	.3Ω				
L8	1st. FM IF	.4Ω	1Ω	502T201		
L9	Fil. Choke	0Ω				
L10	2nd. FM IF	1Ω	1Ω	502T202		
L11	Ratio Det. Trans.	1Ω	.1Ω	502T203	FM-252	Tap at .3Ω
L12	AM Ant. Coil	35Ω	8.5Ω	502T101		
L13	AM RF Coil	36Ω	8.4Ω	502T102		
L14	AM Osc. Coil	4.2Ω		502T105		Tap at .4Ω
L15	1st. AM IF	17Ω	17Ω	502T103		
L16	2nd. AM IF	17Ω	17Ω	502T103		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ALTEC LANSING PART No.		
M1 thru M6	Bayonet	6-8	.25	Blue			Type #44

MISCELLANEOUS

ITEM No.	PART NAME	ALTEC LANSING PART No.	NOTES
M7	Switch		Function (6 Pole - 4 Pos.)
M8	Switch		Cross-over (2 Pole - 3 Pos.)
M9	3 Gang Var. Cap		(22-472MMF, 22-472MMF, 24-199MMF)
A18	Trimmer		FM RF Adj. (4.5-25MMF)
A19	Trimmer		FM Ant. Adj. (4.5-25MMF)

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer under the white dot at the upper left hand end of the dial scale.

AM ALIGNMENT

If the tuner is to be aligned without an amplifier connected, a VTVM connected to the AVC line, (C36), may be used as an indicating device.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7, (Grid), of 6BE6, (V8). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully "Open"	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	200MMF	High side to AM ant. terminal 1, (Disconnect jumper). Low side to chassis.	600KC	AM	600KC	"	A5, A6, A7	"
3.	"	"	1400KC	"	1400KC	"	A8, A9, A10	Adjust for max. output. Repeat steps 2 &3 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1, (grid), of 6BA6, (V4), Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully closed.	DC probe to point (A). Common to chassis.	A11, A12 A13	Adjust for max. deflection. Attenuate signal gen. to maintain 2 volt reading.
5.	"	High side to pin 7, (grid), of 12AT7, (V3). Low side to chassis.	"	"	"	"	A14, A15	"
6.	"	"	"	"	"	DC probe to point (B) Common to Point (C)	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	.01MFD	High side to pin 1, (Grid), of 6BA6, (V4). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. Amp. to point (A) Low side to chassis.	A11, A12, A13	Disconnect stabilizor capacitor C5. Adjust for maximum amplitude & symmetry as per fig. 1.
5.	"	High side to pin 7, (grid), of 12AT7, (V3). Low side to chassis.	"	"	"	"	A14, A15	"
6.	"	"	"	"	"	Vert. Amp. to point (B) Low side to chassis.	A16	Reconnect capacitor C5. Adjust A16 so 10.7MC occurs at center of crossover lines, as per fig. 2. SLIGHTLY retouch A11 for maximum amplitude & straightness of crossover lines.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side thru 270Ω to "hot" FM Ant. terminal. Low side to chassis.	104MC (unmod.)	FM	104MC	DC probe to point (A). Common to chassis.	A17	Adjust for max. deflection.
8.	"	"	92MC	"	92MC	"	L5	Expand or compress coil turns for max. deflection. Repeat steps 7 &8 until no further improvement can be made.
9.	"	"	104MC	"	104MC	"	A18, A19	Adjust for max. deflection.
10.	"	"	92MC	"	92MC	"	L3, L4	Expend or compress coil turns for max. deflection. Repeat steps 9 &10 until no further improvement can be made.

FIG. 1

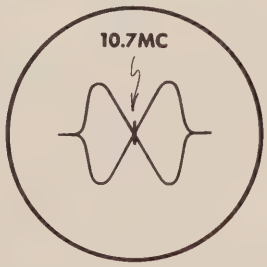

FIG. 2

AMPRO MODEL 731

PROPERTY OF

AMPRO MODEL 731

AMPRO MODEL 731

TRADE NAME	Ampro Model 731
MANUFACTURER	Ampro Corp., 2835 N. Western Ave., Chicago 18, Ill.
TYPE SET	AC Operated Magnetic Tape Recorder And Playback Unit.
TUBES (Four)	Types 12AX7 Bias Osc. - Pre Amp., 6AU6 Amp., 6AUQ5 Audio Output, 6X4 Rectifier.
POWER SUPPLY	110-120 Volts AC RATING .31 Amp @ 117 Volts AC

FOR SERVICE INFORMATION ON MECHANICAL UNIT SEE MODEL 730 - PHOTOFACT SET #133 - FOLDER #4.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

AMPRO MODEL 731

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AMPRO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Bias Osc-Pre Amp	18497-S	12AX7	9A	
V2	AF Amplifier	18699	6AU6	7BK	
V3	Audio Output	18701	6AQ5	7BZ	
V4	Rectifier	18700	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AMPRO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	10	350	18715	AFH3-108		UP3035		TVL-1720	▲ Filter
B	30	350		BR1235A		BR1235A		TVA-1604	■ Filter
C2B	4	350	18716	AFH4-63		UPT1145CC		TVL-4662	▲ Decoupling
B	4	350							■ Decoupling
C	25	15							▲ AF Amp. Cathode
D	25	15							Audio Output Cathode
C3	500		18489	SI500	D6-501	TM5T5	GP2K-501	5GA-T5	Tone Comp.
C4	.03	400	18732	P488- 03		PTE6S3		6TM-S3	AF Amp. Screen Bypass
C5	10000		18487	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Audio Coupling
C6	5000		18488	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Indicator Coupling
C7	10000		18485	BPD-001	DD-102	TM5D1	801-001	5HK-D1	Indicator Filter
C8	.03	400	18492	P488-03		PTE6S3		6TM-S3	Audio Coupling
C9	300	500	18733	1468-0003	D6-301	5W5T3	GP2K-301	MS-33	Tone Comp.
C10	.001	600	18091	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Tone Comp.
C11	.007	200	18739	P488-0068	D6-682	PTE6D68	GP2-333-682	6TM-D68	Audio Coupling
C12	.01	400	17782	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C13	10000		18487	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Audio Coupling
C14	1000		18485	BPD-001	DD-102	TM5D1	801-001	5HK-D1	RF Bypass
C15	.03	400	18732	P488-03		PTE6S3		6TM-S3	Bias Osc. Cathode
C16	500		18489	SI500	D6-501	TM5T5	GP2K-501	5GA-T5	Bias Osc. Grid Cap.
C17	.02	400	18731	P488-02	DF-203	PTE4S2		4TM-S2	Fixed Trimmer
C18	2700		18733	SI2700	D6-272	1R5D3	GP2-333-272		Fixed Trimmer
C19	500		18489	SI500	D6-501	TM5T5	GP2K-501	5GA-T5	Bias Osc. Coupling

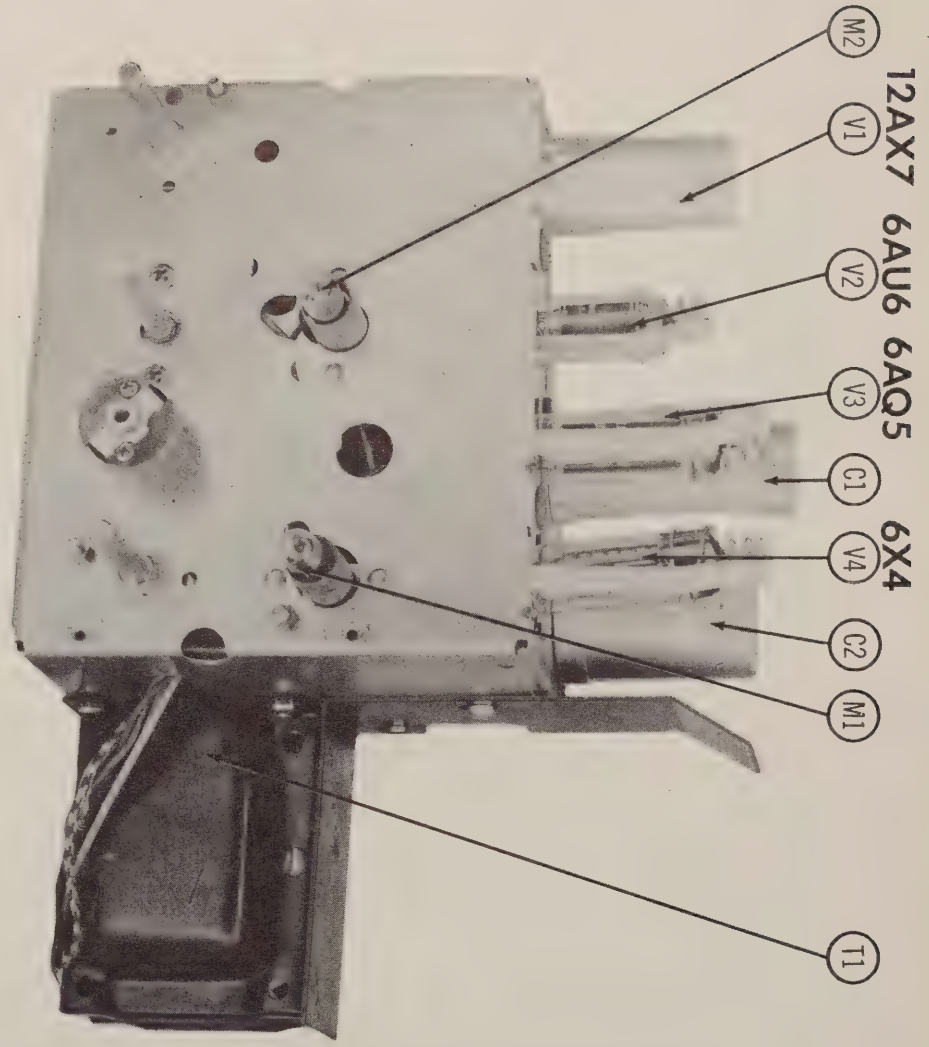
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AMPRO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO.	INSTALLATION NOTES
R1A	500KΩ	½	18709	Q13-133	Ag-60-Z	B-59-S	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	50KΩ	½	18777	Q11-123	AG-44-S	B-31	Tone Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AMPRO PART No.	IRC PART No.	IDENTIFICATION CODES
R3	470KΩ	½	18474	BTS-470K	Bias Osc. Grid
R4	220KΩ	½	17959	BTS-220K	Bias Osc Plate
R5	10Meg	½	17554	BTS-10 Meg	Pre Amp. Grid
R6	220KΩ	½	17959	BTS-220K	Pre Amp. Plate
R7	560KΩ	½	18467	BTS-560K	AF Amp. Plate
R8	2700Ω	½	18582	BTS-2700	AF Amp. Cathode
R9	1.8 Meg	½	18436	BTS-1.8 Meg	AF Amp. Screen
R10	390KΩ	½	18729	BTS-390K	Output Grid
R11	100KΩ	½	18471	BTS-100K	Output Grid
R12	270Ω	1	18770	BTA-270	Output Cathode
R13	22KΩ	½	18583	BTS-22K	Decoupling
R14	220KΩ	½	17959	BTS-220K	Tone Compensation
R15	100KΩ	½	18471	BTS-100K	Indicator Network
R16	220KΩ	½	17959	BTS-220K	Indicator Network
R17	470KΩ	½	18474	BTS- 470K	Indicator Newrok
R18	390KΩ	½	18729	BTS- 390K	Voltage Divider
R19	2700Ω	1	18653	BTA-2700	Filter
R20	390Ω	2	18772	BTB-390	Filter
R21	33Ω	1	18771		Voice Coil Shunt
R22	3Ω	5	18718	1 3/4 A-3	Transformer Shunt - Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AMPRO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .31A	480VCT .050ADC	6.3VAC @ 1.7A		18728	PC-8419	P-3147	PV-60

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AMPRO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5KΩ	3.4Ω	520Ω	.7Ω	18782	A-3877①	A-3019①	RO-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AMPRO PART No.	VIKING PART No.	QUAM PART No.	
SP1A	P. M.	3.4Ω	18775	57J9	57A1	
	CONE DIA.	V. C. DIA.				
SP1B	5"x7"	9/16"				

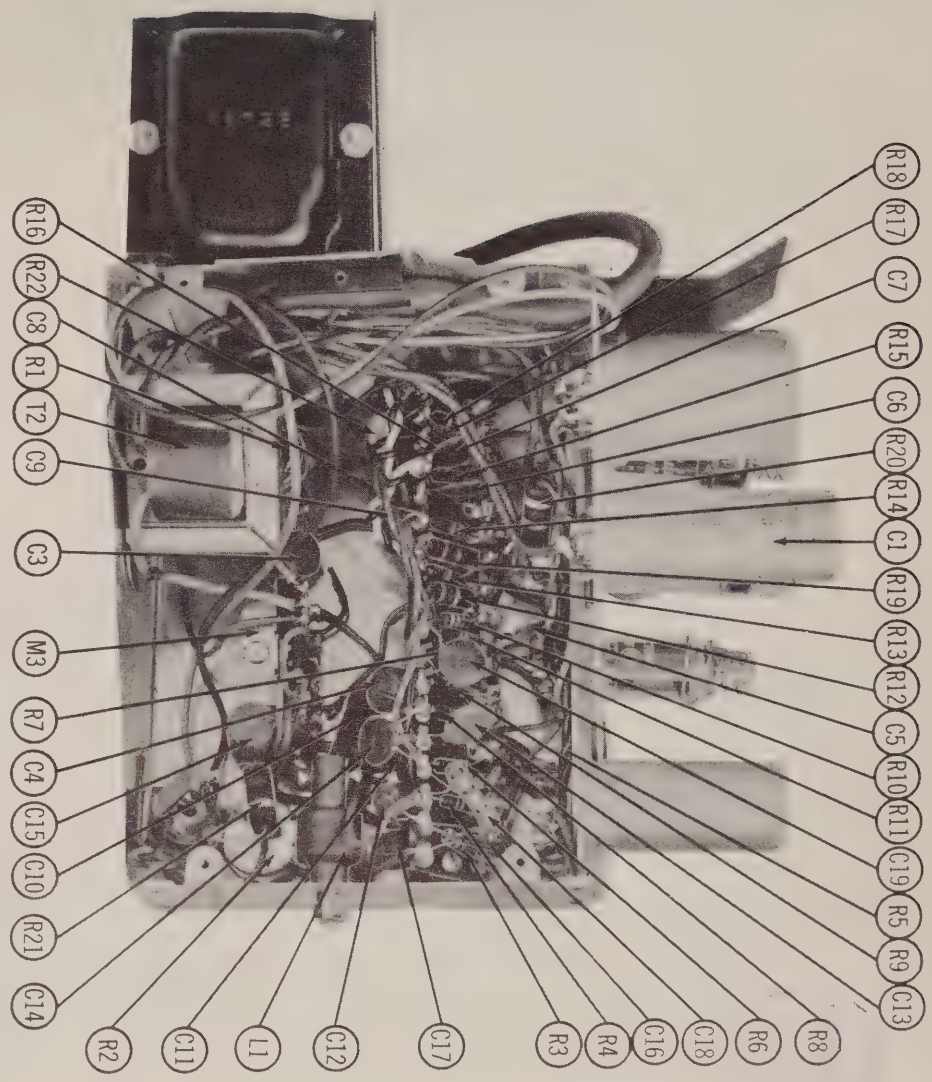
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AMPRO PART No.	MERIT PART No.	
L1	Bias Osc. Coil	103Ω		18784		

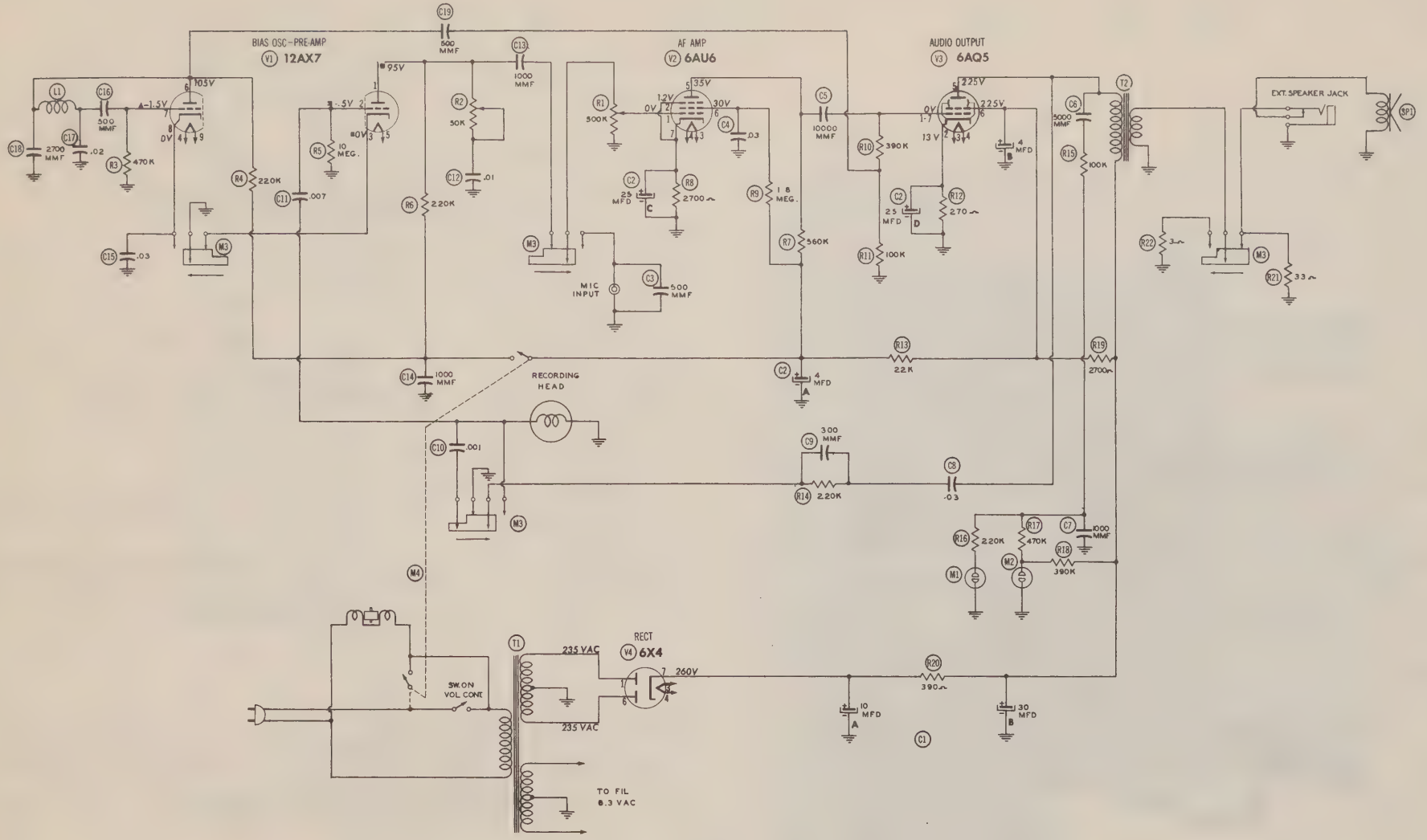
MISCELLANEOUS

ITEM No.	PART NAME	AMPRO PART No.	NOTES
M1	Neon Bulb	16915-1	Type NE-51
M2	Neon Bulb	16915-1	Type NE-51
M3	Switch	17786	Record - Listen
M4	Switch	18696	Motor
	Jack	18708	Phono- Mic
	Jack	18769	Ext. Speaker

CHASSIS—BOTTOM VIEW



AMPRO MODEL 731



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†245KΩ	10Meg	■0Ω	¶.1Ω	¶.1Ω	†245KΩ	470KΩ	0Ω	10Ω
V 2	6AU6	85Ω	2.7KΩ	10Ω	¶.1Ω	†585KΩ	11.8Meg	2.7KΩ		
V 3	6AQ5	490KΩ	270Ω	10Ω	¶.1Ω	†910Ω	†3.1KΩ	490KΩ		
V 4	6X4	100Ω	INF	¶.1Ω	10Ω	INF	170Ω	100KΩ		

ALL MEASUREMENTS TAKEN IN "RECORD" POSITION UNLESS NOTED
† MEASURED FROM PIN 7 OF V4
■ MEASURED IN "PLAY" POSITION
¶ MEASURED FROM PIN 4 OF V4

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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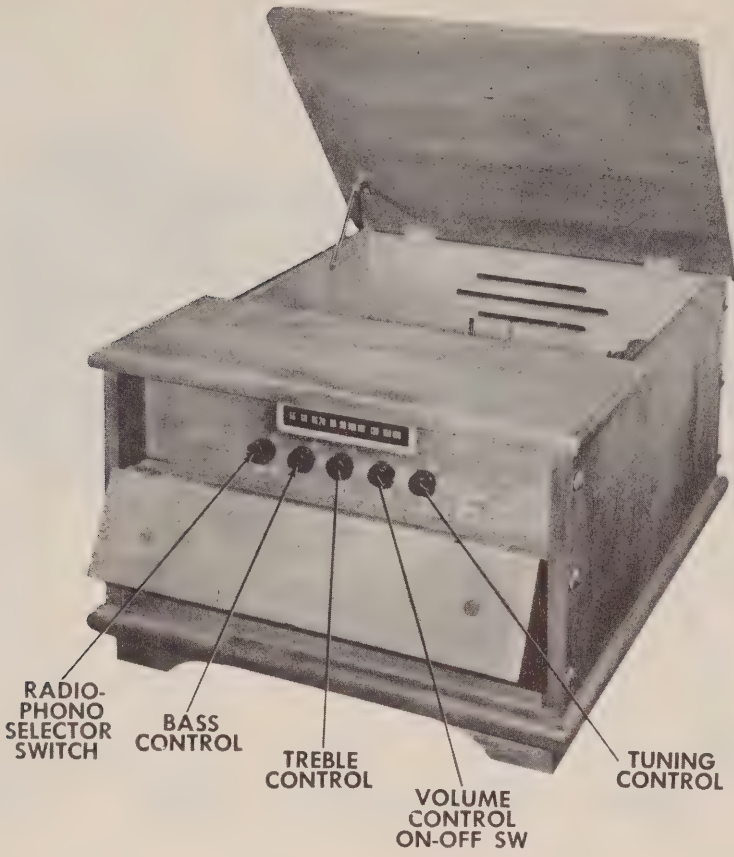
1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of - 15% in voltage and resistance readings.
6 - Proper output load connected.

AUDAR
MODELS AV-7T, WC-7T

PROPERTY OF
L. F. SPARKETSHIP
3 24 [illegible] ST.
DENVER, COLORADO

AUDAR
MODELS AV-7T, WC-7T



AUDAR
MODELS AV-7T, WC-7T

TRADE NAME Audar Models AV-7T, WC-7T
MANUFACTURER Audar, Inc., P.O. Box 438-M, Pasadena 18, Calif.
TYPE SET AC Operated AM-Phono Combination Superheterodyne Reciver (Model WC-7T Has No Phono)
TUBES (Seven) Types 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 12AX7 Phase Inv., (2) 6AK6 Audio Output, 5Y3GT Rectifier.

POWER SUPPLY 110-120 Volts AC RATING .42 Amp @ 117 Volts AC
TUNING RANGE—BROADCAST 540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer 1 1/4 in. to the left of the center of the right hand dial cord pulley shaft.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid), of 6BE6,(V1) Low side to chassis	452KC (400~Mod)	Tuning gang fully "Open"	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	540KC	Tuning gang fully "Closed"	"	A7, A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT -SEE V-M MODEL 950 PHOTOFACT SET #107 - FOLDER #13 OR RECORD CHANGER MANUAL CM-3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		AUDAR PART No.	STANDARD REPLACEMENT		
V1	Converter	6BE6	6BE6	7CH	
V2	IF Amplifier	6BA6	6BA6	7BK	
V3	Det -AVC-AF Amp.	6AT6	6AT6	7BT	
V4	Phase Inverter	12AX7	12AX7	9A	Alternate -12AT7
V5	Audio Output	6AK6	6AK6	7BK	
V6	Audio Output	6AK6	6AK6	7BK	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AUDAR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	450		AFH3-129		UP2245C		TVL-3739	■Filter
B	20	450							▲ Filter
C	20	25							Not used
C2A	20	450		AFH3-129		UP2245C		TVL-3739	■Filter
B	20	450							▲Filter
C	20	25							Audio Output Cathode
C3	20000			P488-02	DF-203	PTE4S2		4TM-S2	AVC Filter
C4	20000			P488-02	DF-203	PTE4S2		4TM-S2	AVC Filter
C5	50			SI50	D6-500	TM5Q5	GP1K-500	5GA-Q5	Osc. Grid Cap.
C6	20000			P688-02	DF-203	PTE6S2		6TM-S2	Osc. Anode Bypass
C7	20000			P688-02		PTE6S2		6TM-S2	IF Amp. Screen Bypass
C8	20000			P688-02		PTE6S2		6TM-S2	Decoupling
C9	250			SI250	D6-251	5W5T25	GP2K-251	6TM-S2	Diode RF Filter
C10	250			SI250	D6-251	5W5T25	GP2K-251	5GA-T25	Diode RF Filter
C11	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C12	20000			P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C13	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	Tone Comp.
C14	500			SI500	D6-501	TM5T5	GP2K-501	5GA-T5	Tone Comp.
C15	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	Tone Comp.
C16	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C17	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C18	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C19	20000			P688-02		PTE6S2		6TM-S2	Line Filter
C20	20000			P688-02		PTE6S2		6TM-S2	Line Filter

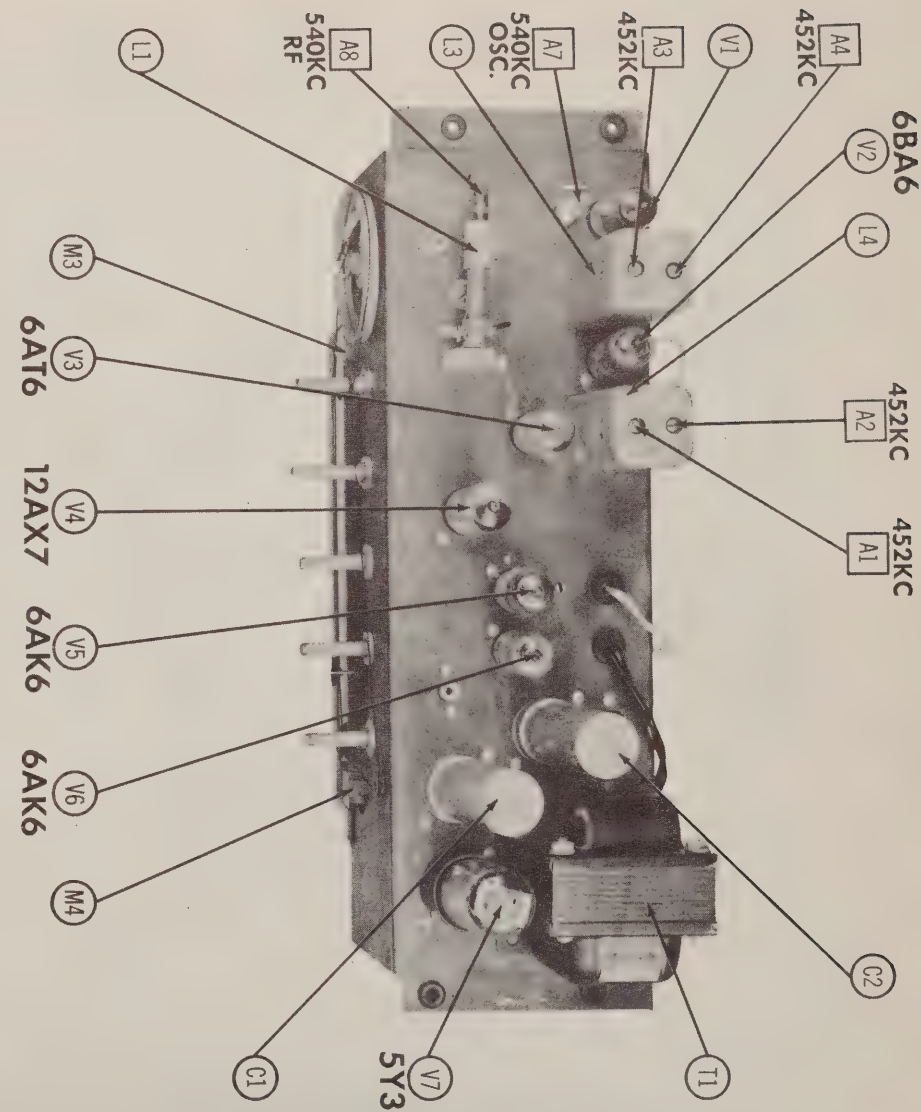
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	AUDAR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO:	
R1A	500KΩ	1/2	W-3304	Q13-133	AG-60-Z	B-59-S	Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A per instructions.
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions.
R2A	500KΩ	1/2		Q11-133	AG-58-S	B-59	Bass Control
B	Shaft			Not Req	RS-2	Not kReq.	Attach to R2A per instructions.
R3A	500KΩ	1/2		Q11-133	AG-58-S	B-59	Treble Control .
B	Shaft			Not Req.	RS-2	Not Req.	Attach to R3A per instructions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AUDAR PART No.	IRC PART No.	
R4	2.2Meg	1/2		BTS-2.2Meg	AVC Network
R5	30KΩ	1/2			Osc. Grid - See note 1.
R6	10KΩ	1		BTA-10K	Osc. Anode - See note 2.
R7	100Ω	1/2		BTS-100	IF Amp. Cathode
R8	30KΩ	1/2			IF Amp. Screen - See note 3.
R9	30KΩ	1/2			IF Amp. Screen - See note 4.
R10	1000Ω	1		BW-1-1000	IF Amp. Decoupling - Wire Wound
R11	50KΩ	1/2			Diode Filter
R12	2.2Meg	1/2		BTS-2.2Meg	AVC Network
R13	4.7Meg	1/2		BTS-4.7Meg	1st AF Amp. Grid
R14	250KΩ	1/2			1st AF Amp. Plate
R15	470KΩ	1/2		BTS-470K	Tone Compensation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AUDAR PART No.	IRC PART No.	
R16	30KΩ	½			2nd AF Amp. Grid - See note 1.
R17	2400Ω	1			2nd AF Amp. Cathode
R18	50KΩ	1			2nd AF Amp. Plate
R19	250KΩ	½			Phase Inverter Grid
R20	20KΩ	1			Phase Inverter Grid
R21	3900Ω	1		BTA-3900	Phase Inverter Cathode - See note 5.
R22	20KΩ	1			Phase Inverter Plate
R23	500Ω	3			Output Cathode - Wire Wound - See note 6.
R24	470KΩ	½		BTS-470K	Output Grid
R25	470KΩ	½		BTS-470K	Output Grid
R26	1Meg	½		BTS-1Meg	Series Phono
R27	270KΩ	½		BTS-270K	Phono Isolation
R28	1000Ω	10		1 3/4A-1000	Voltage Divider - Wire Wound
R29	1000Ω	2		BW-2-1000	Filter - Wire Wound

Note 1. Some models use a 25KΩ resistor in this application.
Note 2. Some models use a 20KΩ resistor in this application.
Note 3. Some models use a 50KΩ resistor in this application.
Note 4. Not used in all models.
Note 5. Some models use a 2400Ω resistor in this application.
Note 6. Some models use a 250Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AUDAR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② .42A	610VCT .048ADC	5VAC ② 2A	6.3VAC ②1.8A	T6308	PC8407	P-3150①	

① Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUDAR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	6KΩ CT	3.4Ω	440Ω CT	.4Ω	T-1689	A-3824	A-2935	RO-305	

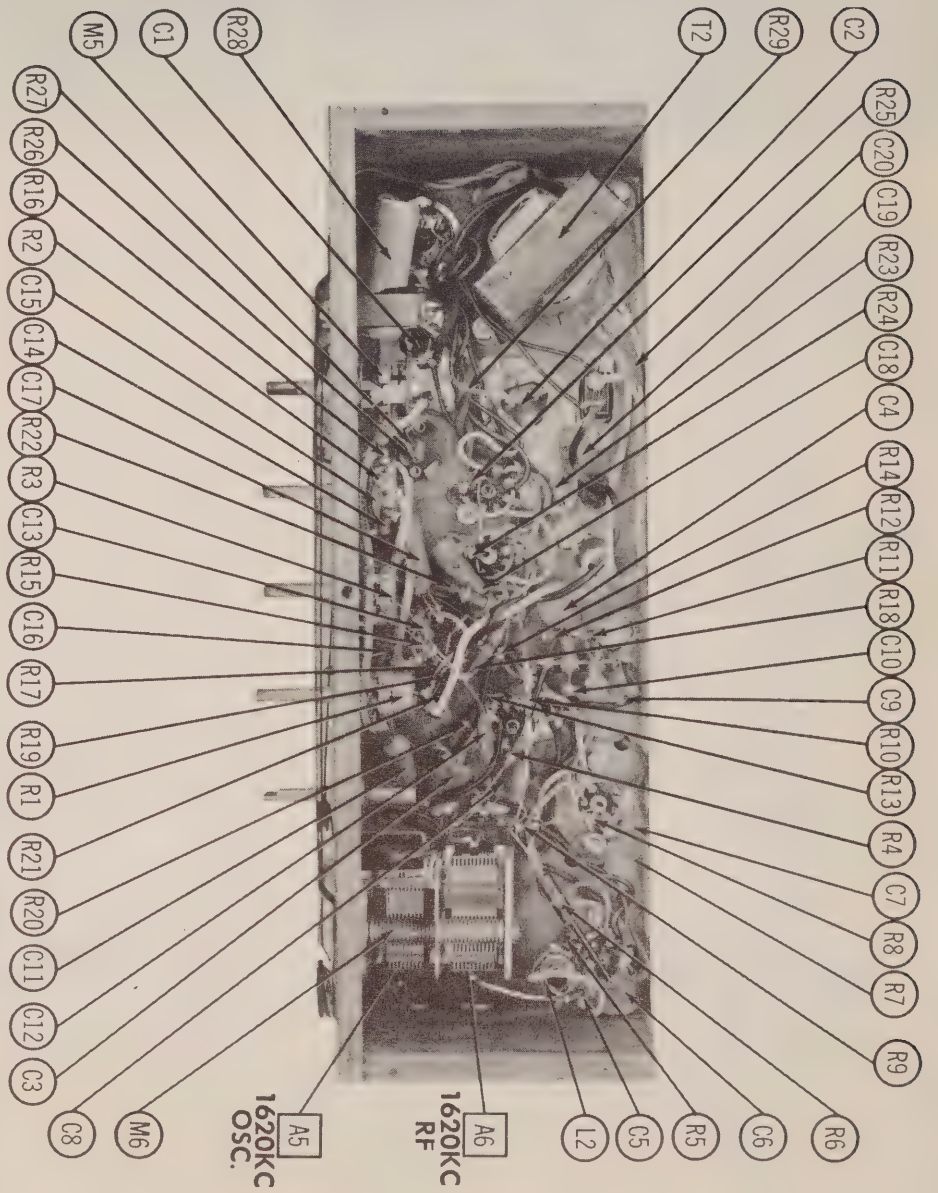
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AUDAR PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P. M.	3.4Ω		ST-115 Mod. P8-V	8A21	
	CONE DIA.	V. C. DIA.				
SP1B	8"	3/4"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AUDAR PART No.	MERIT PART No.	
L1	Ant. Coil	1.2Ω				
L2	Osc. Coil	.5Ω	5Ω			
L3	Input IF	11Ω	11Ω			
L4	Output IF	11.5Ω	11.5Ω			

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	AUDAR PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A62A A65MG	96	0-1 or S-1 & 0-3 or S-3	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

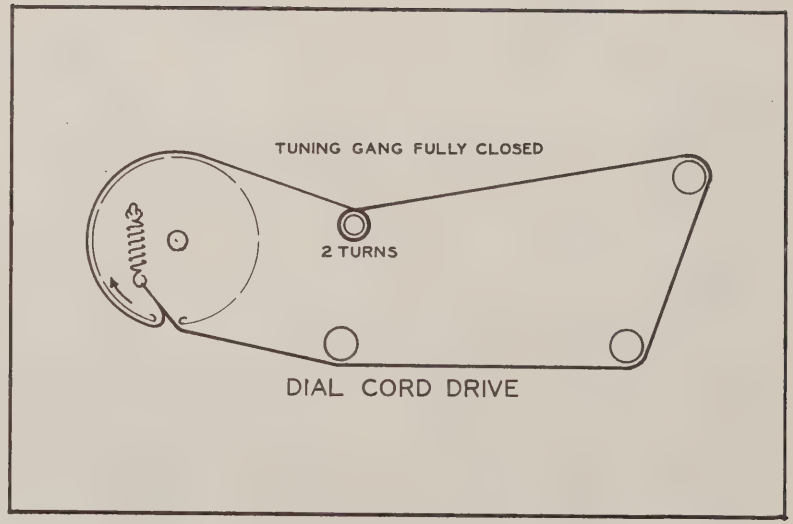
ITEM No.	REPLACEMENT DATA			REMARKS
	AUDAR PART No.	WALCO PART No.	JENSEN PART NO.	
M2		W-30A and W-30MGS	JP-30 & JPS-30LP	

DIAL LIGHTS

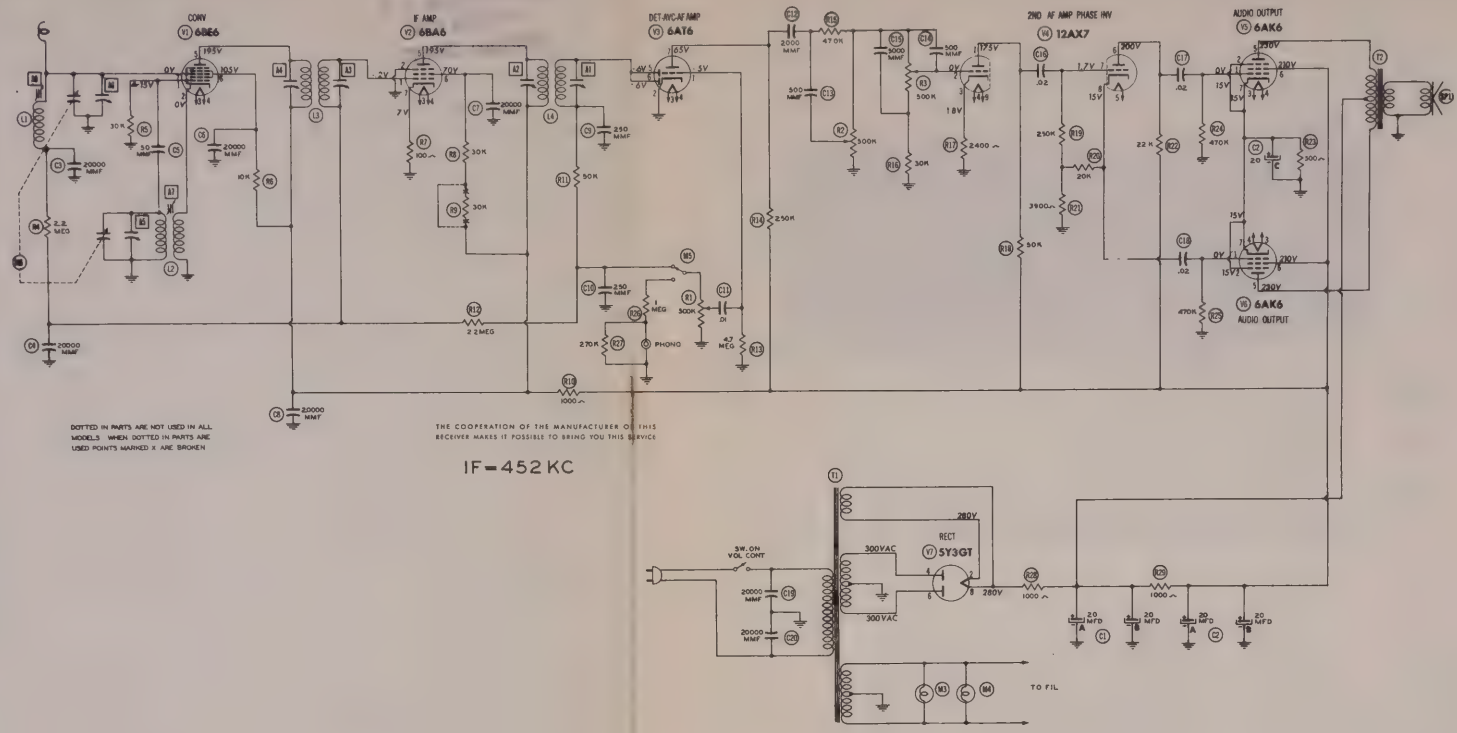
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AUDAR PART No.		
M3	Bayonet	6-8	.15	Brown			Type No. #47
M4	Bayonet	6-8	.15	Brown			Type No. #47

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M5 M6	Switch 2Gang Var. Cap		Radio-Phono (29-404MMF, 36-202MMF)



DIAL CORD DRIVE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BE6	30KΩ	.6Ω	.1Ω	.1Ω	†3KΩ	†13KΩ	4.9Meg		
V 2	6BA6	2.9Meg	0Ω	.1Ω	.1Ω	†3KΩ	†63KΩ	100Ω		
V 3	6AT6	4.7Meg	0Ω	.1Ω	.1Ω	550KΩ	550KΩ	†250KΩ		
V 4	12AX7	†52KΩ	260KΩ	2.4KΩ	.1Ω	.1Ω	†22KΩ	270KΩ	24KΩ	.1Ω
V 5	6AK6	470KΩ	500Ω	.1Ω	.1Ω	†1.2KΩ	†2KΩ	500Ω		
V 6	6AK6	470KΩ	500Ω	.1Ω	.1Ω	†1.2KΩ	†2KΩ	500Ω		
V 7	5Y3GT	INF	80KΩ	INF	300Ω	INF	305Ω	INF	80KΩ	

ALL MEASUREMENTS TAKEN WITH "M5" IN RADIO POSITION
▲TAKEN WITH VACUUM TUBE VOLTMETER.
† MEASURED FROM PIN 2 OF V7.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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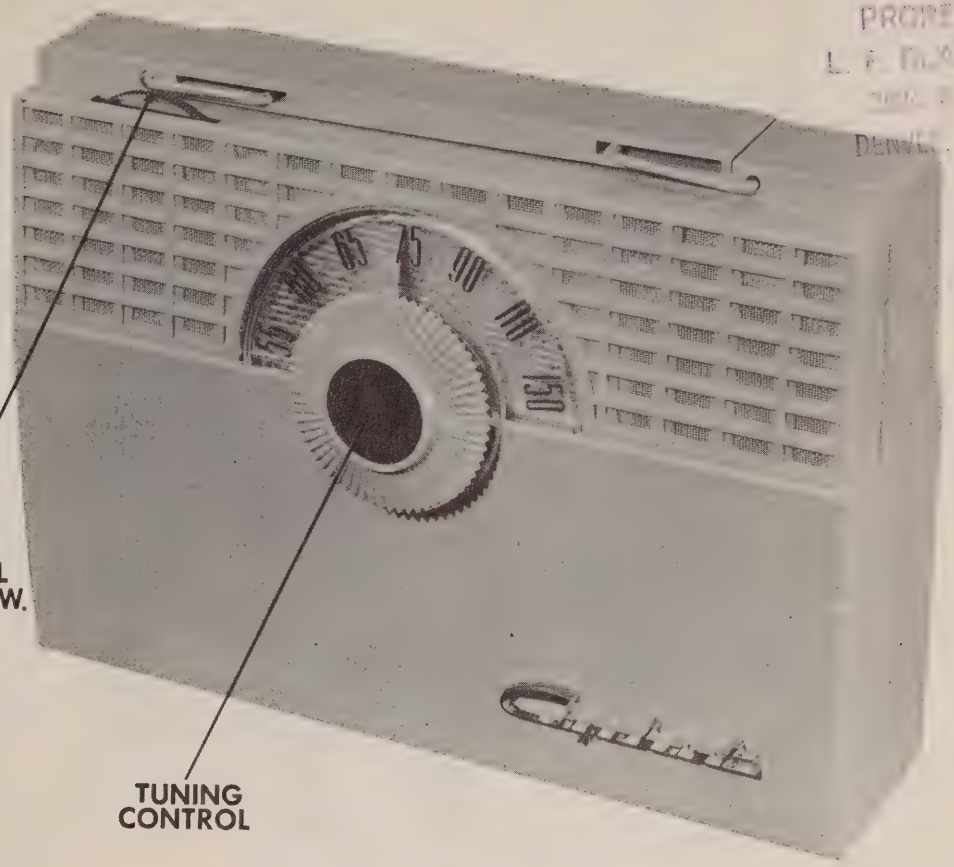
CAPEHART
MODEL 10 (Ch. C-312)



CAPEHART
MODEL 10 (Ch. C-312)

TRADE NAME	Capehart Model 10 (Ch. C-312)
MANUFACTURER	Capehart-Farnsworth Corp., Fort Wayne, Ind.
TYPE SET	Battery Operated Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	1.5 Volts DC "A" Supply & 67.5 Volts DC "B" Supply
RATING	250 MA @ 1.5 Volts DC & 10MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	532-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6, (Grid) of 1R5, (V1), Low side to chassis.	455KC (400~Mod.)	Tuning gang fully "Open".	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	"
3.		"	532KC	Tuning gang fully "Closed"	"	A6	Adjust for maximum output. Repeat steps 2 & 3 until no further improvement can be made.
4.		"	1500KC	Tune for Max. output.	"	A7	Adjust for max. output.
5.		"	600KC	"	"	L1	Expand or compress coil turns, (section of winding nearest volume control), for maximum output. Repeat steps 4 & 5 until no further improvement can be made.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		CAPEHART PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	10	70	452132A-2	SRE150/10		BBR10-90		TVA-1406	Decoupling
C2	.05	200	650450A-473	P288-05	DF-503	PJ2S5		2TM-S5	AVC Filter
C3	47		2240-006	SI47NP0	TCZ-47		NP0K-470	5TCC-Q47	Osc. Grid Cap
C4	5000		450469A-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Osc. Anode Bypass
C5	5000		450469A-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	IF Amp. Grid Filter
C6A	100		†452171A-1	SI100	†PC-50	TM5T1	GP1K-101	†100C1	Diode RF Filter
B	100			SI100		TM5T1	GP1K-101		Diode RF Filter
C7	100		2240-014	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	RF Bypass
C8	5000		450469A-1	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Audio Coupling
C9A	100			SI100		TM5T1	GP1K-101	5GA-T1	AF Amp. Plate Bypass
B	5000		♦452615A-2	BPD-005	♦PC-90	TM5D5	811-005	5HK-D5	AF Amp. Screen Bypass
C	5000			BPD-005		TM5D5	811-005	5HK-D5	Audio Coupling
C10	.0047	200	650450A-472	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Audio Output Plate

†Items C6A, C6B, R6 are combined in one unit.
♦Items C9A, C9B, C9C, R8A, R8B, R8C are combined on one unit.

CONTROLS

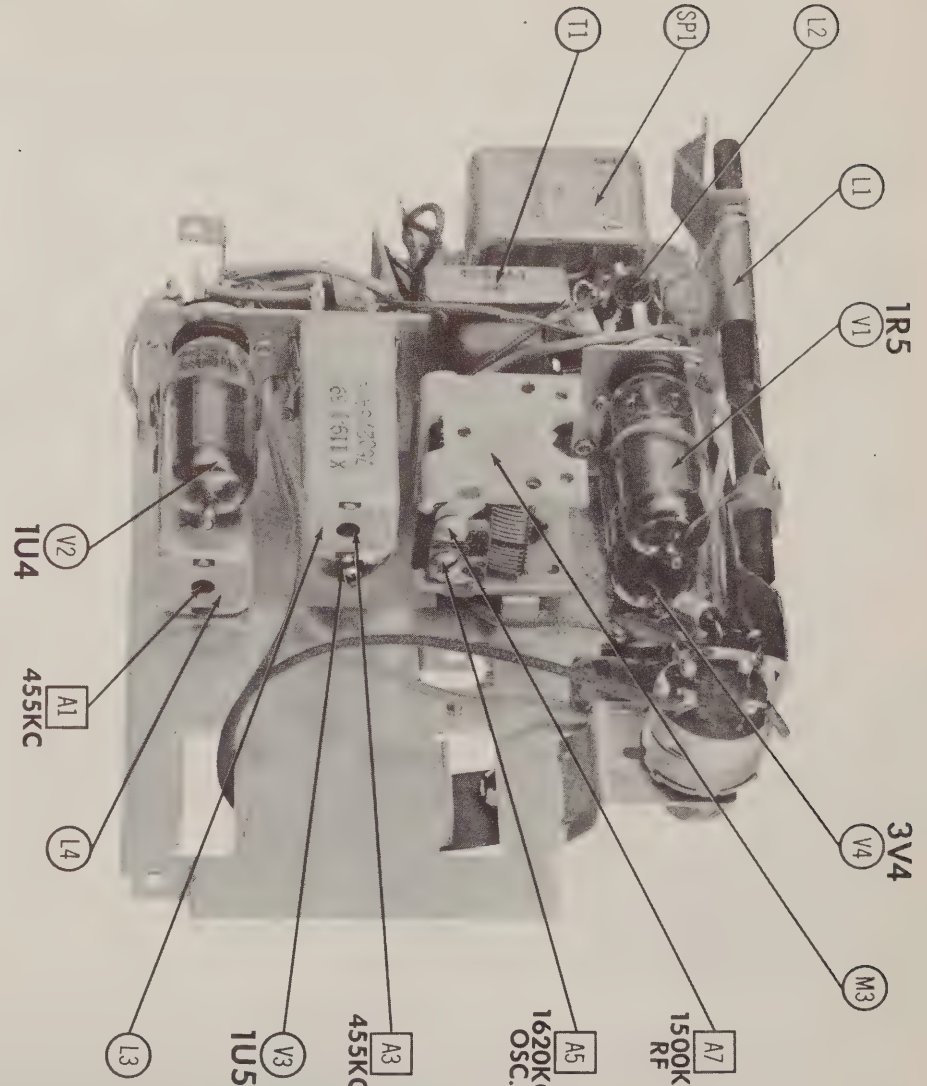
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO.	
R1A	1Meg	½	750276A-1	Q13-137	AG-63-Z	B-70-S	Volume Control.
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A per instructions.
C	Switch		Not Req.	76-2	SWB-2	Not Req.	Attach to R1A per instructions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	CAPEHART PART No.	IRC PART No.	
R2	3.3Meg	½	3229-335	BTS-3.3Meg	AVC Network
R3	100KΩ	½	3229-104		Osc. Grid
R4	15KΩ	½	3229-153		Osc. Anode
R5	3.3Meg	½	3229-335	BTS-3.3Meg	IF Amp. Grid
R6	47KΩ	½	†452171A-1	BTS-47K	Diode Filter
R7	10Meg	½	3229-106	BTS-10Meg	AF Amp. Grid
R8A	4.7Meg	½	♦452615A-2	BTS-4.7Meg	AF Amp. Screen
B	1Meg	½		BTS-1Meg	AF Amp. Plate
C	2.2Meg	½		BTS-2.2Meg	Output Grid
R9	390Ω	½	3229-391	BTS-390	Bias Network

† Items R6, C6A, C6B are combined in one unit.
♦ Items R8A, R8B, R8C, C9A, C9B, C9C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		CAPEHART PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	8KΩ	6Ω	520Ω	.4Ω	452612A-1		A-2927		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	CAPEHART PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P. M.	6Ω	650451A-1			
	CONE DIA.	V. C. DIA.				
SP1B	1 3/4"x2 ½"	7/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	CAPEHART PART No.	MERIT PART No.	
L1	Loop Ant.	.5Ω		452614A-1		
L2	Osc. Coil	1.6Ω	7.5Ω	452610A-1		
L3	Input IF	19Ω	19Ω	750273A-1		
L4	Output IF	19Ω	19Ω	452612A-1		

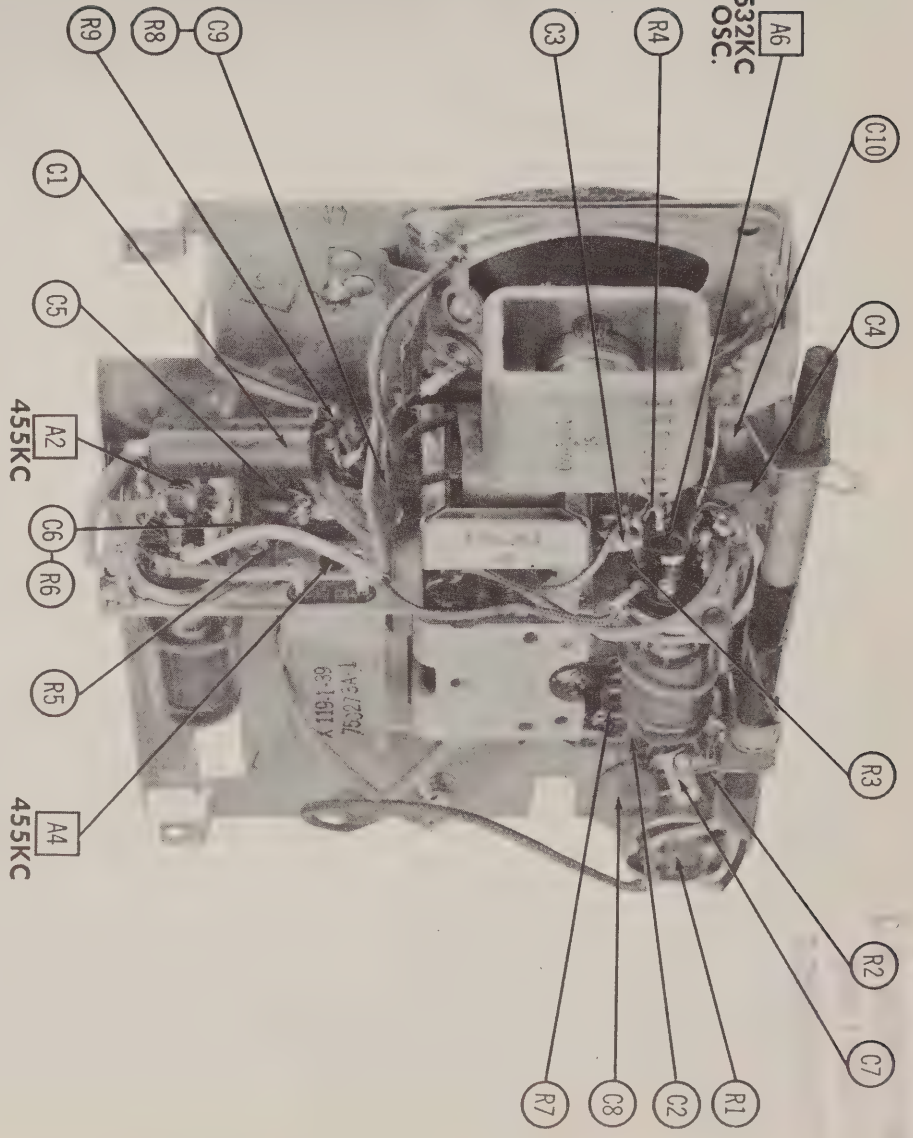
BATTERIES

ITEM No.	VOLTAGE	CAPEHART PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V		950			2R			
M2	67.5V			467			XX45		

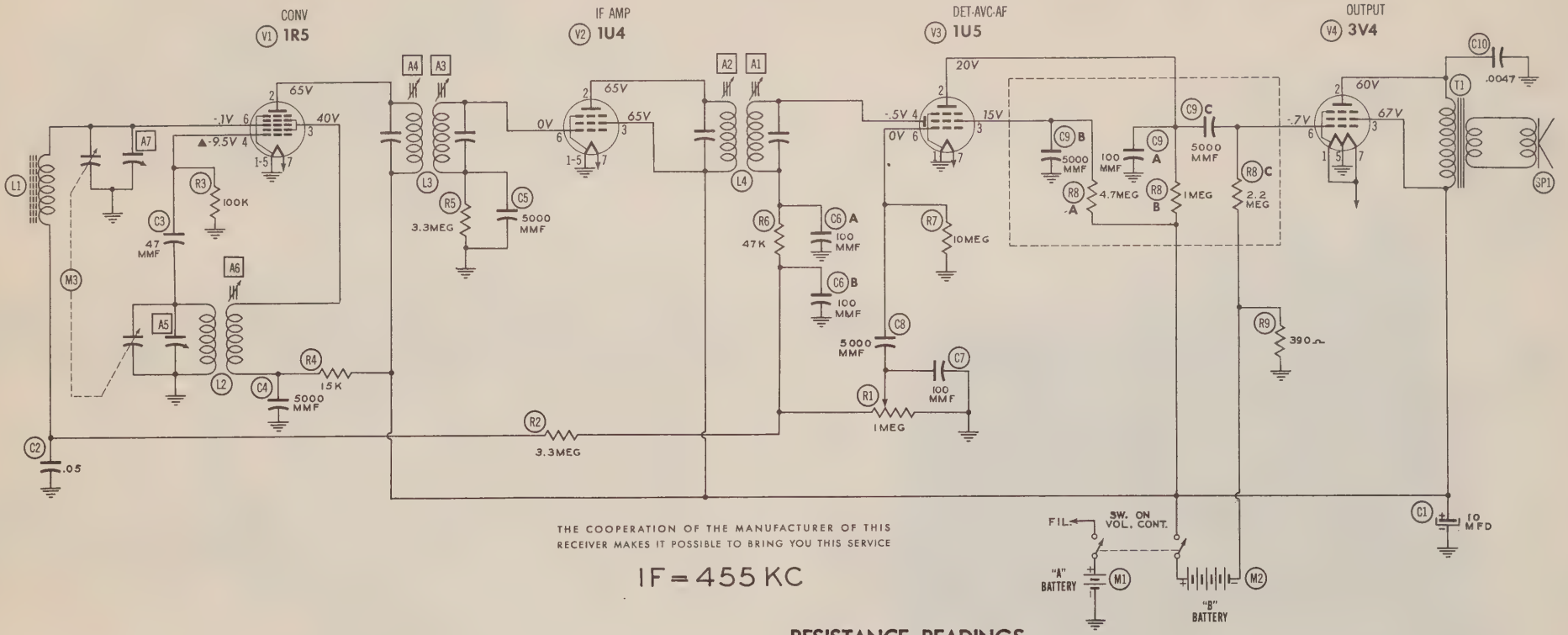
MISCELLANEOUS

ITEM No.	PART NAME	CAPEHART PART No.	NOTES
M3	2 Gang Var. Cap.	650448A-1	(10-197MMF, 15-157MMF)
	Cabinet	452815A-G4	Green
	Cabinet	452815A-G1	Taupe
	Cabinet	452815A-G3	Burgundy
	Dial Pointer	452748A-1	

CHASSIS—BOTTOM VIEW



CAPEHART MODEL 10



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†20Ω	†15KΩ	100KΩ	0Ω	4.3Meg	*
V 2	1U4	0Ω	†20Ω	†0Ω	1Meg	0Ω	3.3Meg	*
V 3	1U5	0Ω	†1Meg	†4.7Meg	1Meg	390Ω	10Meg	*
V 4	3V4	*	†520Ω	†0Ω	†0Ω	0Ω	2.2Meg	*

†MEASURE FROM PIN 3 OF V4.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.
*** DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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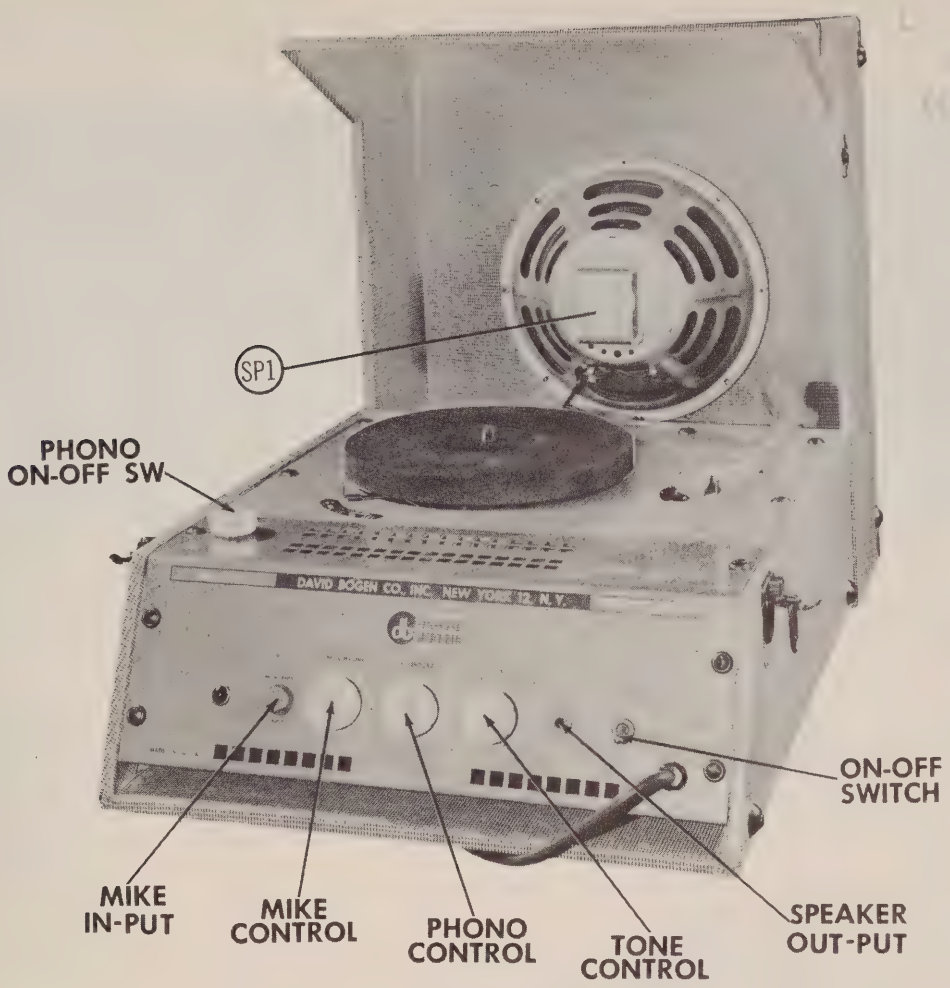
166-7

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltage measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

DAVID BOGEN
MODEL DP-16



DAVID BOGEN
MODEL DP-16

TRADE NAME	David Bogen Model DP-16
MANUFACTURER	David Bogen Co. Inc., 633 Broadway, New York 17, N. Y.
TYPE SET	AC Operated 2 Channel Audio Amplifier
TUBES (FIVE)	Types 6SL7GT Pre-Amp., 6SN7GT AF Amp.-Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .6 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Pre Amplifier	6SL7GT	6SL7GT	8BD	
V2	AF Amplifier Phase Inverter	6SN7GT	6SN7GT	8BD	
V3	Audio Output	6V6GT	6V6GT	7AC	
V4	Audio Output	6V6GT	6V6GT	7AC	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DAVID BOGEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	10	450		AFH2-47		UPT1145		TVL-2750	■ Filter
B	10	450							▲ Filter
C2A	5	450		AFH4-09		UP5Q45		TVL-4760	▬ Audio Output Screen
B	5	450							■ AF Amp. Decoupling
C	5	450							▲ Pre Amp. Decoupling
D	5	450							Pre Amp. Decoupling
C3	50	50		PRS50/50		BR505		TVA-1308	Audio Output Cathode
C4	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C5	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C6	250	500		1468-00025	D6-251	5W5T25		1FM-325	Tone Comp.
C7	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C8	350	500		1468-00035				1FM-335	Tone Comp.
C9	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C10	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C11	5	500		1468-000005		5W5V5	GP1K-050	MS-55	Tone Comp.
C12	.03	400		P488-03		PTE6S3		6TM-S3	Tone Comp.
C13	.006	400		P488-006		PTE6D6	GP2-333-602	6TM-D6	Tone Comp. †
C14	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Tone Comp.
C15	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Tone Comp. ¶
C16	.1	400		489ZGXY		PJ4P1		4TM-P1	Line Filter
C17	.03	400		P688-03		PTE6S3		6TM-S3	Tone Comp. *

* Not used in all Models
† Some Models use .005MFD in this application
¶ Some Models use .05MFD in this application

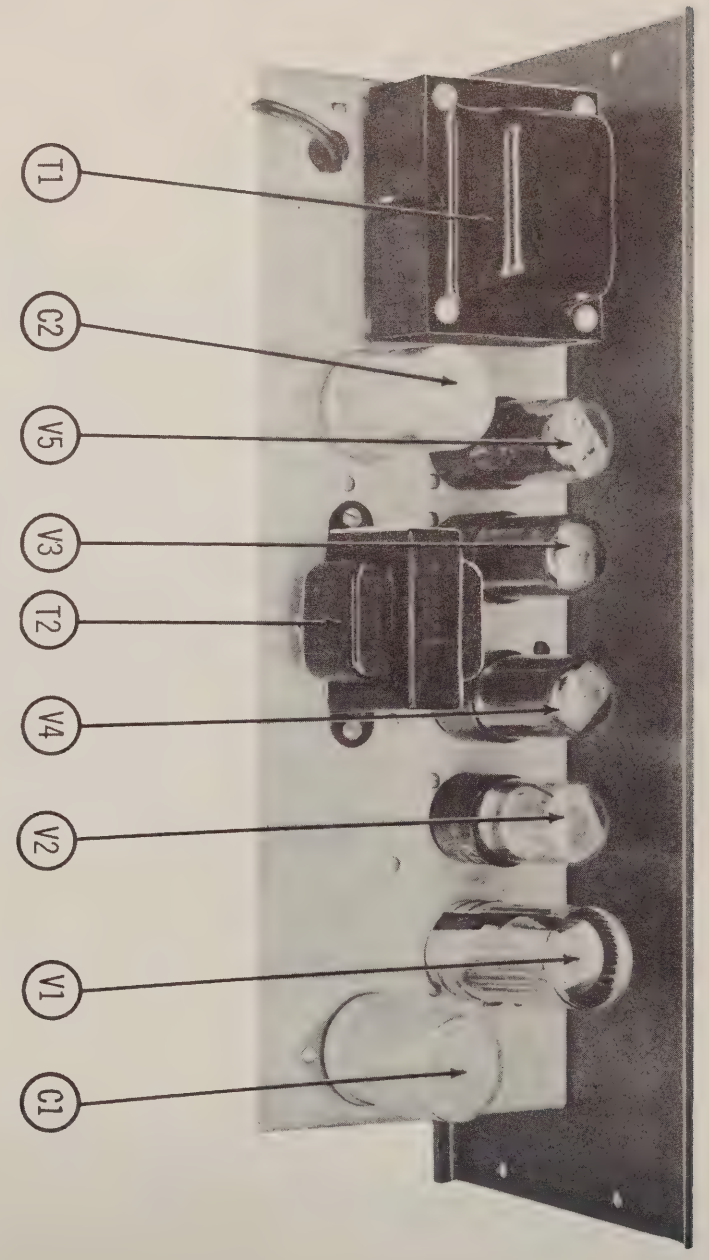
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	500KΩ	½	V-202B	Q13-133	M-60-Z	B-60	Microphone Volume Control
R2	500KΩ	½	V-202B	Q13-133	M-60-Z	B-60	Phonograph Volume Control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: David Bogen PART No.	IRC PART No.	IDENTIFICATION CODES
R3	2.2Meg	½		BTS-2.2Meg	Pre Amp. Grid
R4	220KΩ	½		BTS-220K	Pre Amp. Plate
R5	220KΩ	½		BTS-220K	Isolation
R6	750KΩ	½			Tone Compensation - See Note 1
R7	220KΩ	½		BTS-220K	Phono Input Shunt
R8	2200Ω	½		BTS-2200	Pre Amp. Cathode
R9	100KΩ	1		BTA-100K	Pre Amp. Plate
R10	100KΩ	1		BTA-100K	Pre Amp. Plate Decoupling
R11	470KΩ	½		BTS-470K	AF Amp. Grid
R12	330Ω	½		BTS-330	AF Amp. Cathode
R13	3300Ω	½		BTS-3300	AF Amp. Cathode
R14	220KΩ	½		BTS-220K	AF Amp. Plate
R15	2200Ω	½		BTS-2200	Feedback Network

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	
R16	3900Ω	½		BTS-3900	Phase Inverter Cathode
R17	220KΩ	½		BTS-220K	Phase Inverter Plate
R18	27KΩ	½		BTS-27K	Phase Inverter Grid
R19	470KΩ	½		BTS-470K	Output Grid
R20	470KΩ	½		BTS-470K	Output Grid
R21	270Ω	2			Output Cathode
R22	47KΩ	2		BTB-47K	Voltage Divider
R23	3300Ω	½		BTS-3300	Decoupling
R24	2200Ω	2		BTB-2200	Filter
R25	100KΩ	1		BTA-100K	Tone Compensation
R26	68 ΩΩ	½		BTS-6800	Tone Compensation
R27	15KΩ	½		BTS-15K	Tone Compensation
R28	15KΩ	½		BTS-15K	Tone Compensation
R29	2200Ω	½		BTS-2200	Tone Compensation
R30	150Ω	½		BTS-150	Tone Compensation
R31	500Ω	4		1 3/4A-500	Filter
R32	4.7Ω	½			Series Pilot Light
R33	220KΩ	½		BTS-220K	Tone Compensation - See Note 2

Note 1. Some Models use a 1Meg Resistor in this application.
Note 2. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @.6A	660VCT .080ADC	5VAC @2.0A	6.3VAC @1.5A	T362-1	PM-8409 ①	P-2952	PH-90 ②

① Add Series Resistor to Reduce Plate Voltage
② Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		David Bogen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5KΩ CT	6.8Ω	400Ω CT	.6Ω	T265-3 T265-2 ④	A-3830	A-2905 ③	RO-302	③ Drill One New Mounting Hole ④ Alternate Transformer

SPEAKER

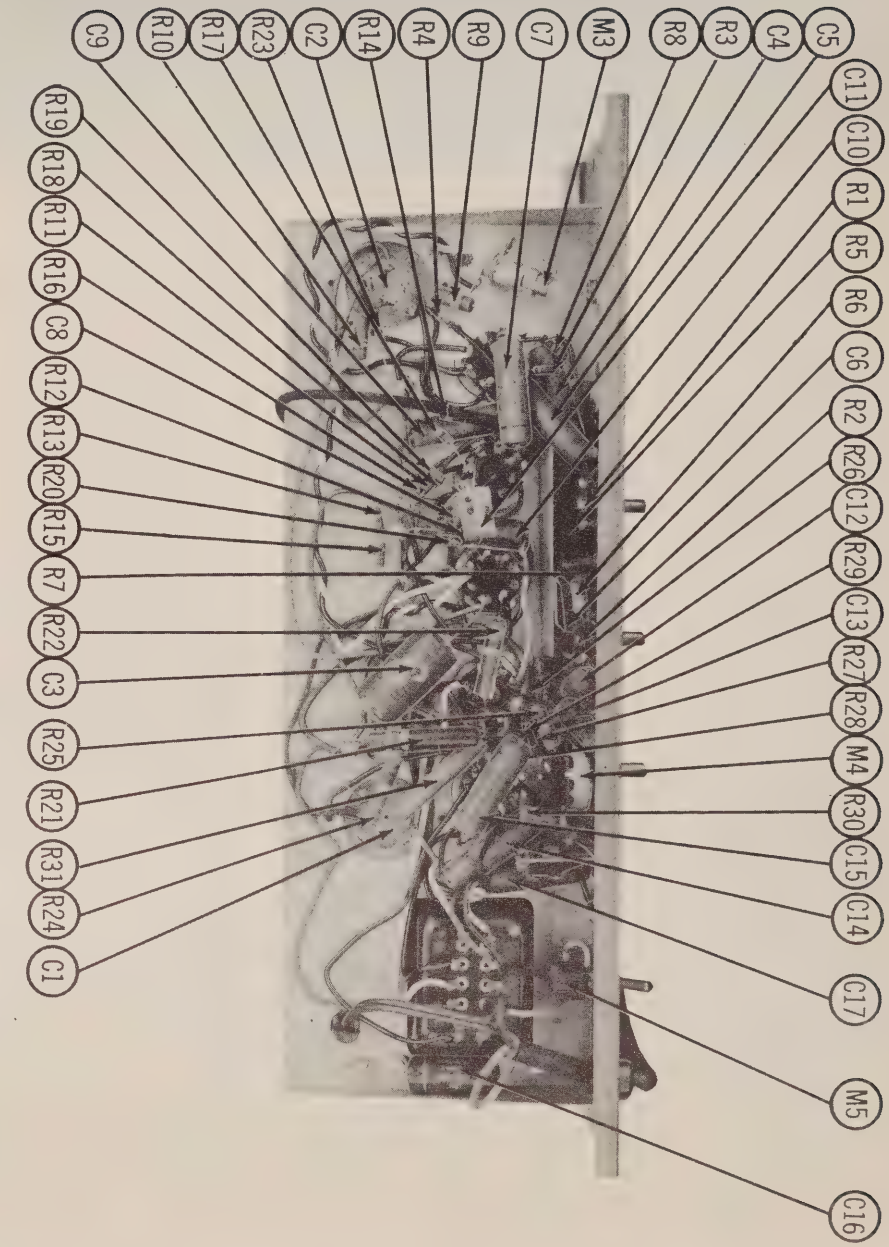
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	David Bogen PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	6.8Ω		ST-120 Mod. P10-S	10A4	
	CONE DIA.	V. C. DIA.				
SP1B	10"	1"				

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	David Bogen PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LQD-1J	"Q" Q-33			96	0-1 or S-1 & 0-3 or S-3	① Complete tone arm and cartridge assby.
		400-D ①						

ASTATIC AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	David Bogen PART No.	WALCO PART No.	JENSEN PART NO.	
M2		W-2A or W-2S and W-2MGA or W-2MGS	A-80 or A-81 and A-80LP or A-81LP	

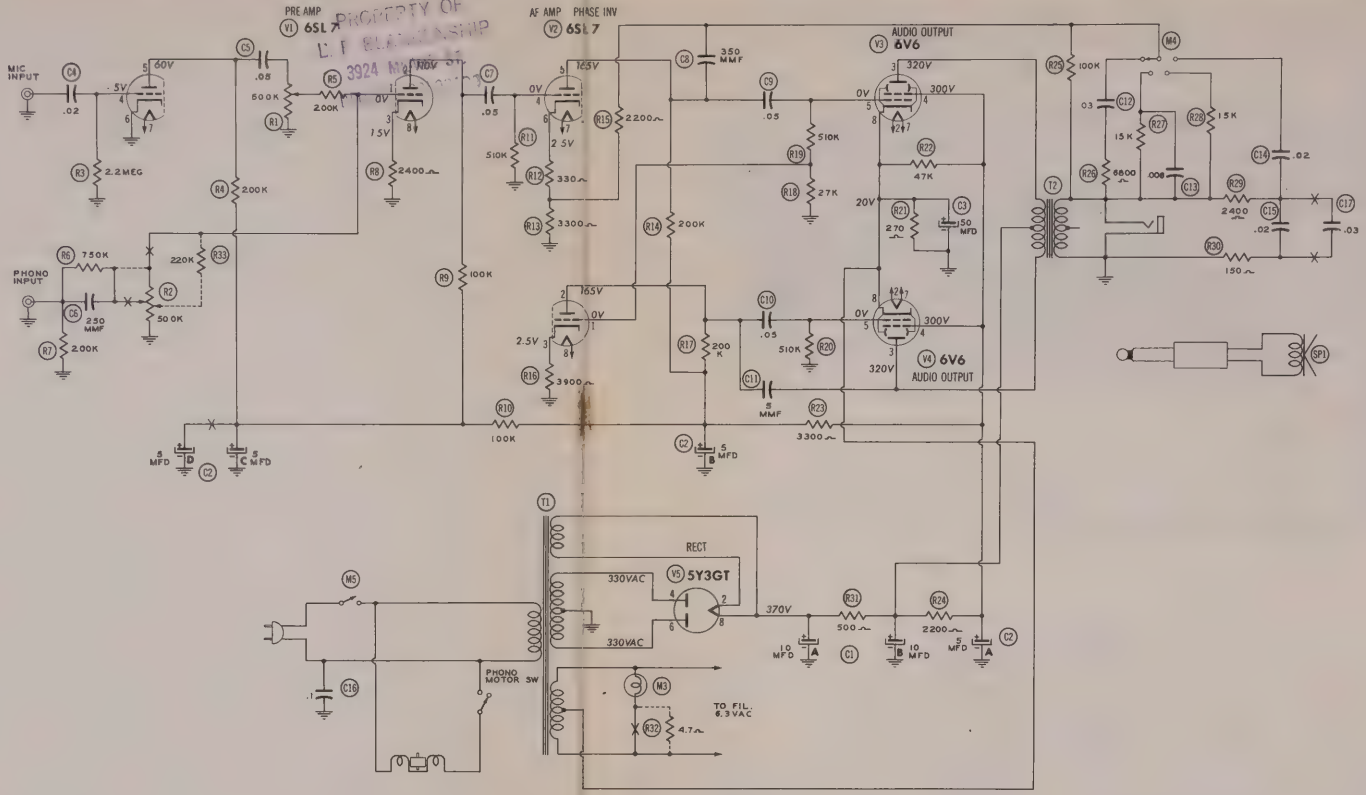
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					David Bogen PART No.		
M3	Bayonet	6-8	.15	Brown			Type No. #47

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M4	Switch		Tone
M5	Switch		On/Off

PROPERTY OF
L. F. BLANKSHIP
3924 M...



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SL7GT	150KΩ	†200KΩ	2.4KΩ	2.2Meg	†200KΩ	0Ω	¶0Ω	¶.1Ω
V 2	6SL7GT	27KΩ	†200KΩ	3.9KΩ	510KΩ	†200KΩ	3.6KΩ	¶0Ω	¶.1Ω
V 3	6V6GT	INF	¶.1Ω	†700Ω	†2.7KΩ	525KΩ	0Ω	¶0Ω	270Ω
V 4	6V6GT	INF	¶.1Ω	†700Ω	†2.7KΩ	510KΩ	INF	¶0Ω	270Ω
V 5	5Y3GT	150Ω	35KΩ	INF	170Ω	†500Ω	180Ω	2.4KΩ	35KΩ

† MEASURED FROM PIN 6 OF V5
¶ MEASURED FROM PIN 7 OF V4

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1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MODEL 700D

EMERSON
MODELS 700D, 701D, (Ch. 120158-B)

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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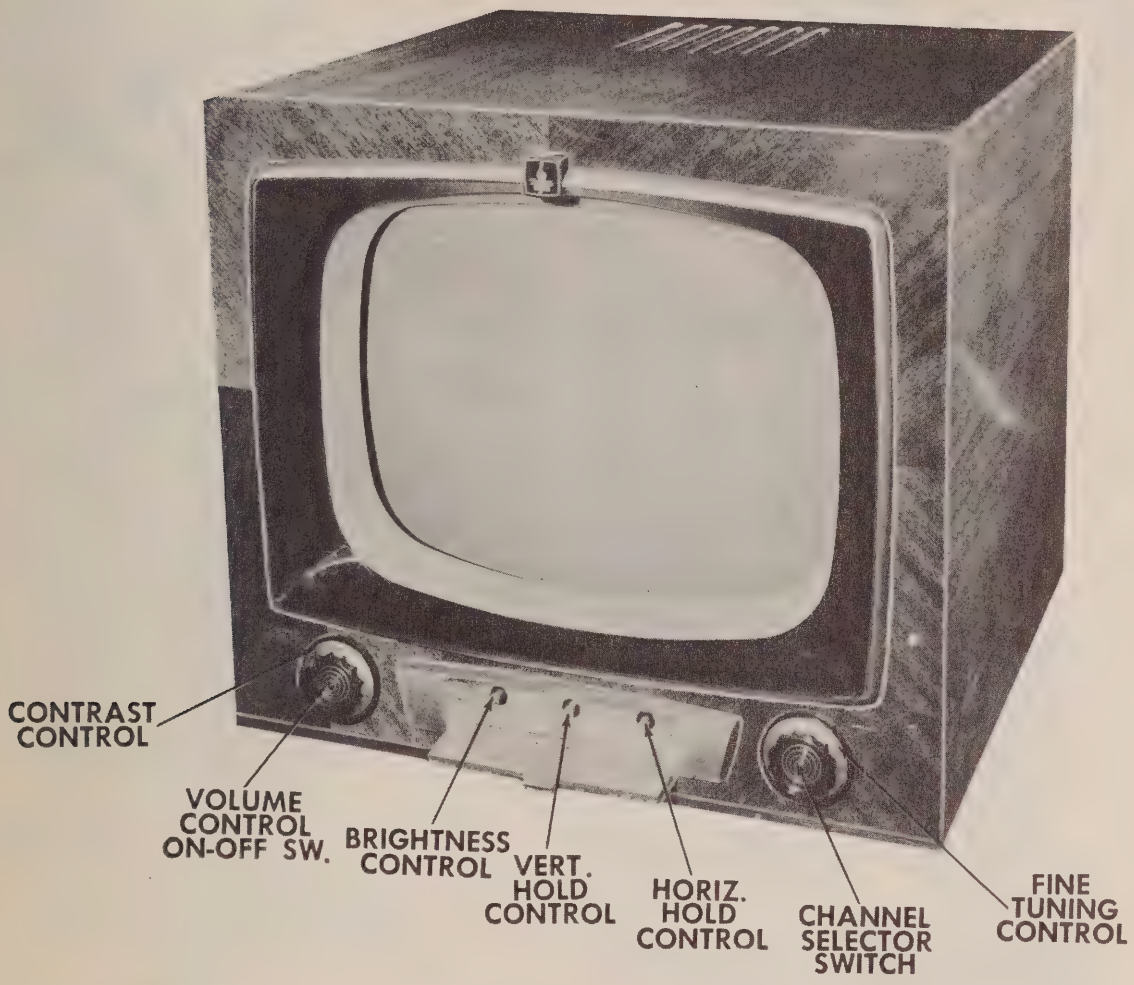
DATE 5-52 SET 166 FOLDER 9

EMERSON
MODELS 700D, 701D, (Ch. 120158-B)



EMERSON
MODELS 700D, 701D, (Ch. 120158-B)

EMERSON MODEL 700D

TRADE NAME	Emerson Models 700D, 701D, (Ch. 120158-B)
MANUFACTURER	Emerson Radio & Phono Corp., 111 8th Ave., New York, N. Y.
TYPE SET	Television Receiver
TUBES	Twenty Three

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.65 Amp. @ 117 Volts AC
TUNING RANGE—CHANNELS 2 Thru 13.

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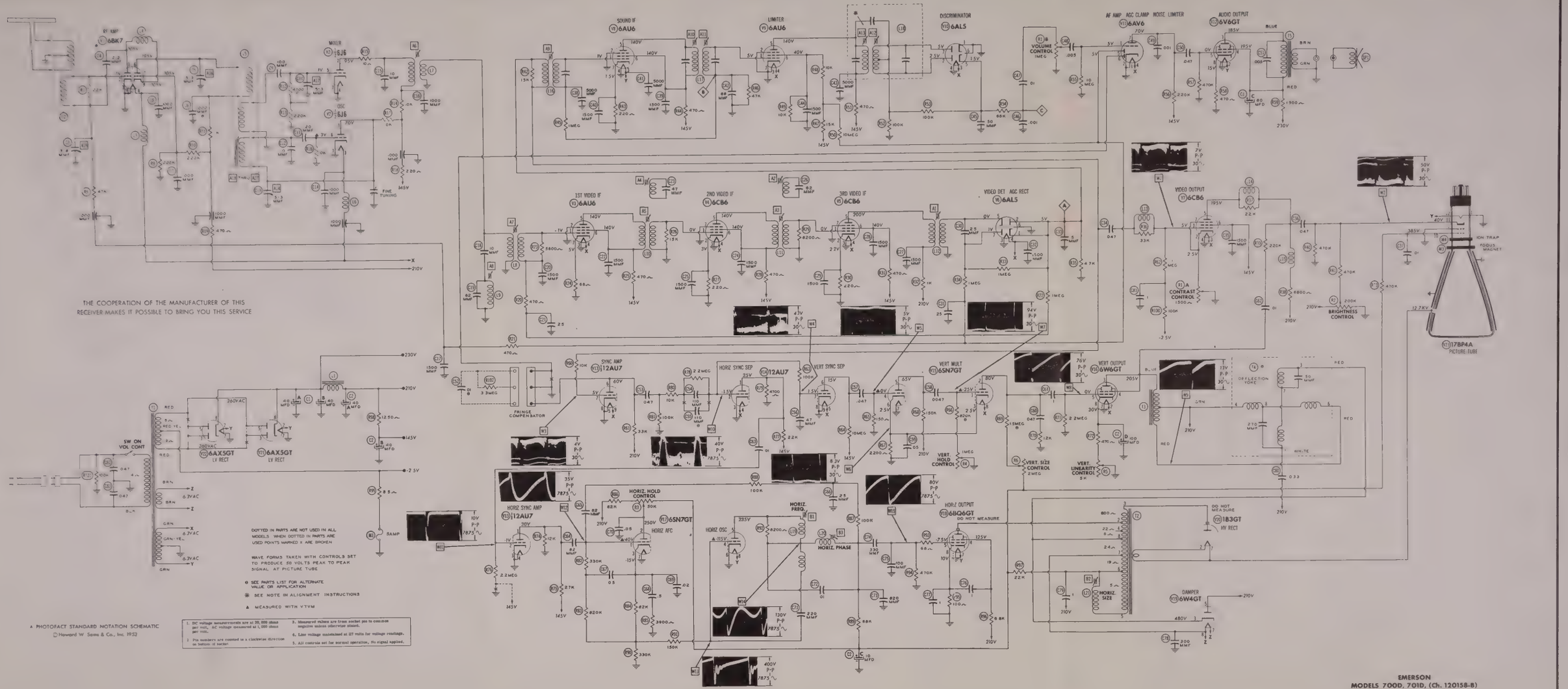
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
SEE NOTE IN ALIGNMENT INSTRUCTIONS
MEASURED WITH VTVM
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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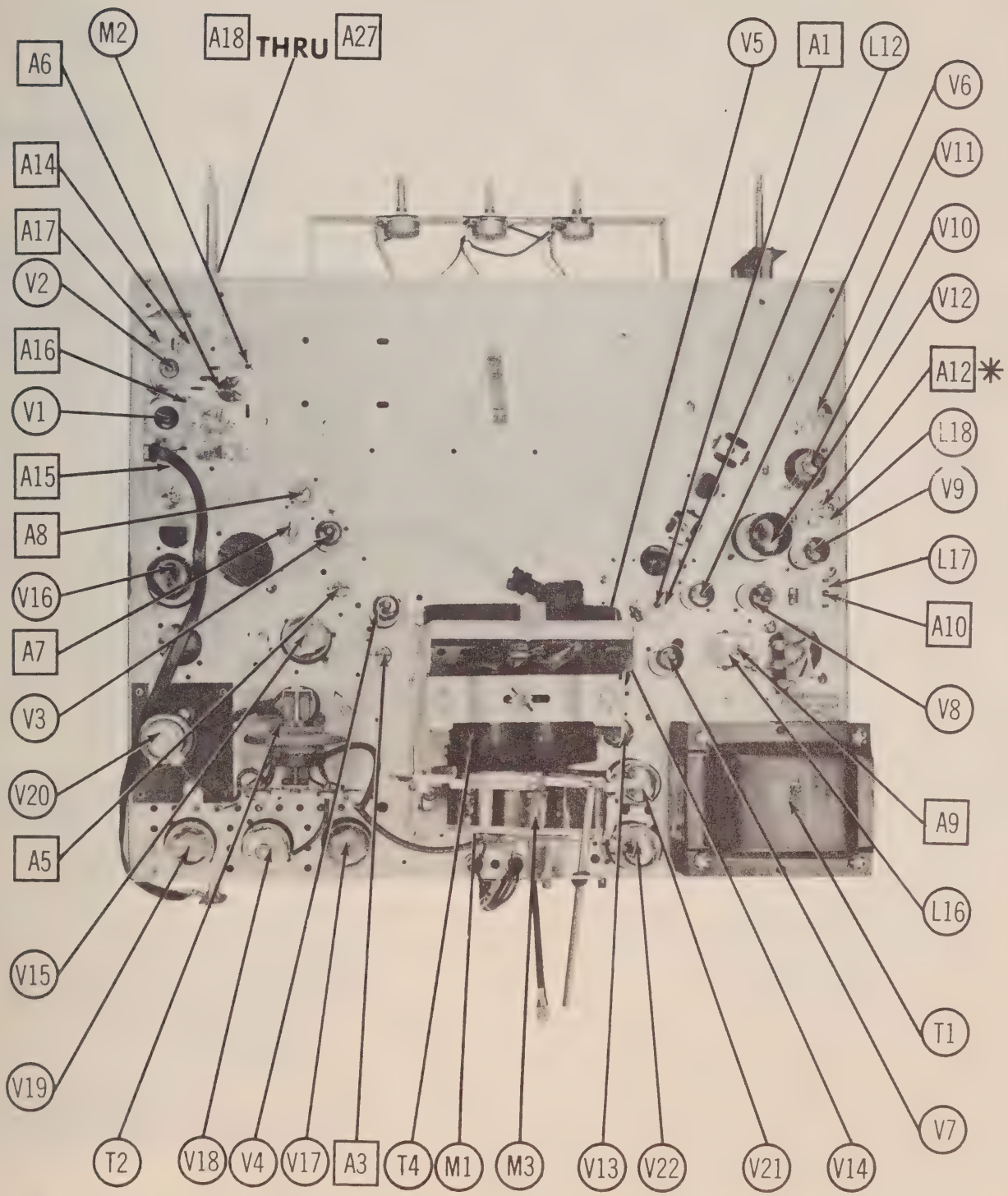
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
EMERSON
MODELS 700D, 701D, (Ch. 120158-B)



*--SEE ALIGNMENT

CHASSIS TOP VIEW

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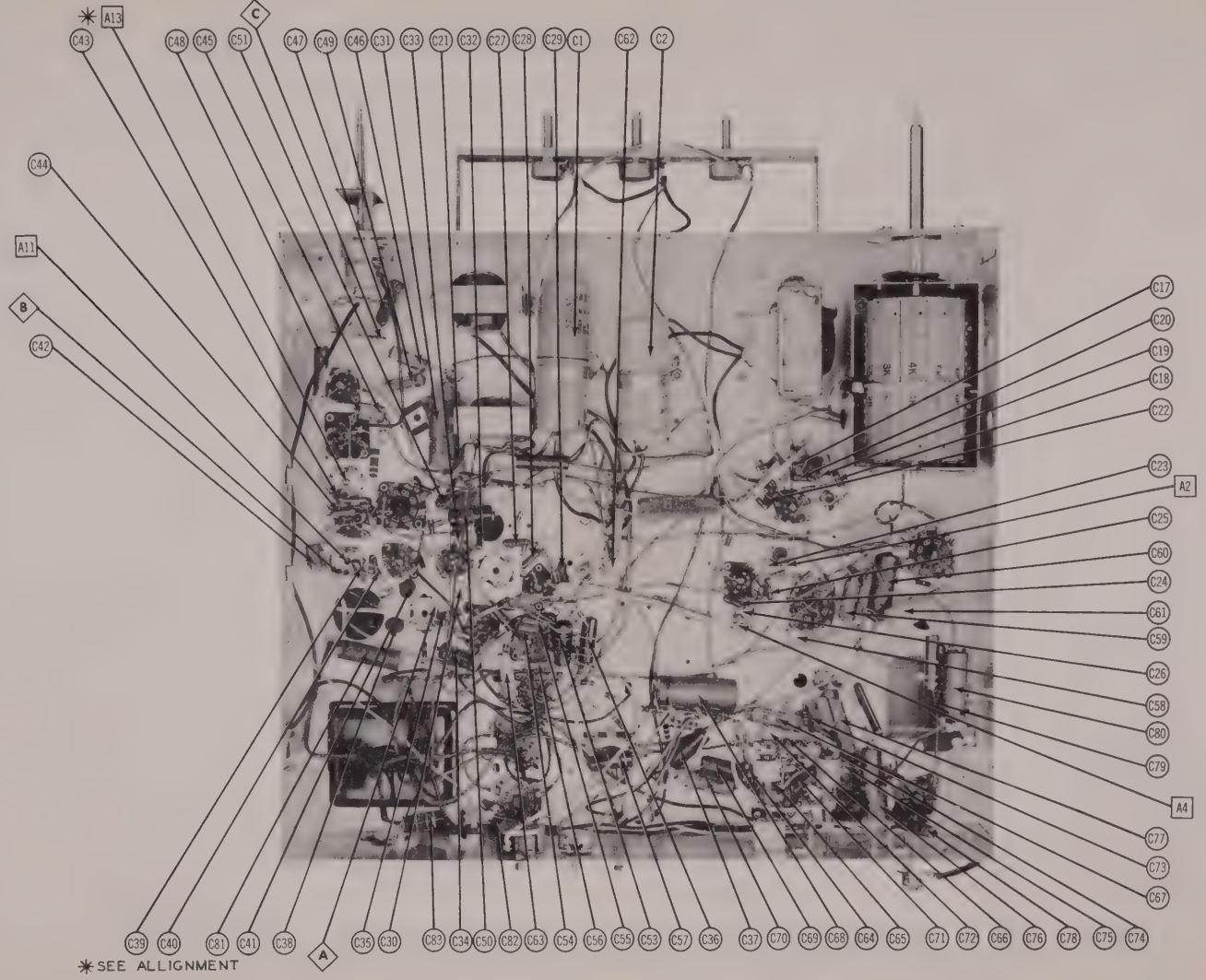

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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TOP VIEW

BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C21, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to Pin 1, (grid) of 6AU6, (V3). Low side to chassis.	Not used	23.8MC (unmod.)	Any	Use VTVM DC probe to Point A. Common to chassis.	A1	Adjust for maximum deflection
2.	"	"	"	21.25MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	22.8MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	"	27.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	"	25.25MC	"	"	A5	Adjust for maximum deflection.
6.	"	"	24MC (10MC swp.)	21.25MC	"	Vert. amp. thru 10KΩ to Point A. Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1, A3 & A4 for proper response.
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	"	22.5MC 25.75MC	"	Vert. amp. thru detector (Fig. 2) to Pin 5, (plate) of 6AU6 (V3). Low side to chassis.	A6, A7	Adjust for response curve similar to Fig. 3.
8.	"	"	Not used	21.75MC	"	Use VTVM DC probe to Point A. Common to chassis.	A8	Temporarily connect a short across trap A2. Adjust for MINIMUM deflection.
9.	"	"	24MC (10MC swp.)	21.25MC 22.25MC 25.75MC 27.25MC	"	Vert. amp. thru 10KΩ to Point A. Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1 thru A7 for proper response.

SOUND IF ALIGNMENT

These receivers employ two discriminator transformers.
Transformer #708018 has the secondary, (A12) on top and the primary on the bottom. Transformer #708017 has the secondary on the bottom and primary on top. Check the part number on the transformer before adjusting it and proceed accordingly.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to Pin 2, (plate) of 6AL5, (V6). Low side to chassis.	4.5MC (450KC swp)	4.5MC	Any	Vert. amp. thru 10KΩ to Point B. Low side to chassis.	A9, A10 A11	Adjust for maximum amplitude & symmetry as per Fig. 4.
11.	"	"	"	"	"	Vert. amp. to Point C. Low side to chassis.	A12, A13 (see note above)	Adjust A12 so 4.5MC occurs at center of "S" curve as shown in Fig. 5. Adjust A13 for maximum amplitude & straightness of diagonal line with symmetrical peaks.

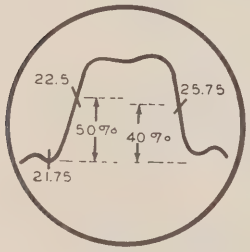


FIG.1

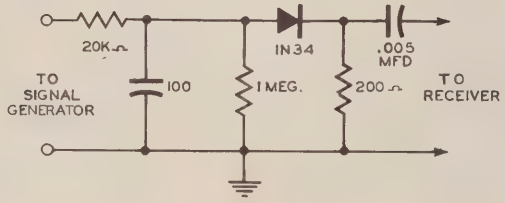


FIG.2

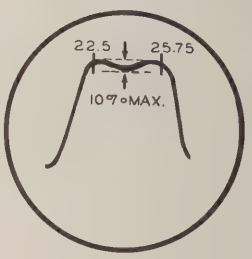


FIG.3

FIG.4

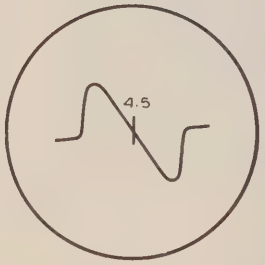


FIG.5

ALIGNMENT INSTRUCTIONS (CONT.)

TUNER ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of oscillosope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC swp.)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point (A). Low side to chassis.	A14	Adjust to place sound marker in "notch" as shown in Fig. 6. The video marker should be at 50%.
13.	"	"	"	"	"	"	A15, A16, A17	Adjust for maximum amplitude of response curve with shape shown in Fig. 6.
14.	"	"	213MC (10MC swp.)	215.75MC	13	"	A18	Adjust to place sound marker in notch as shown in Fig. 6.
			201MC (10MC swp.)	203.75MC	11		A19	
			195MC (10MC swp.)	197.75MC	10		A20	
			189MC (10MC swp.)	191.75MC	9		A21	
			183MC (10MC swp.)	185.75MC	8		A22	
			177MC (10MC swp.)	179.75MC	7		A23	
			85MC (10MC swp.)	87.75MC	6		A24	
			79MC (10MC swp.)	81.75MC	5		A25	
			69MC (10MC swp.)	71.75MC	4		A26	
			63MC (10MC swp.)	65.75MC	3		A27	
			57MC (10MC swp.)	59.75MC	2		A28	

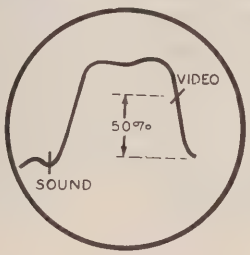
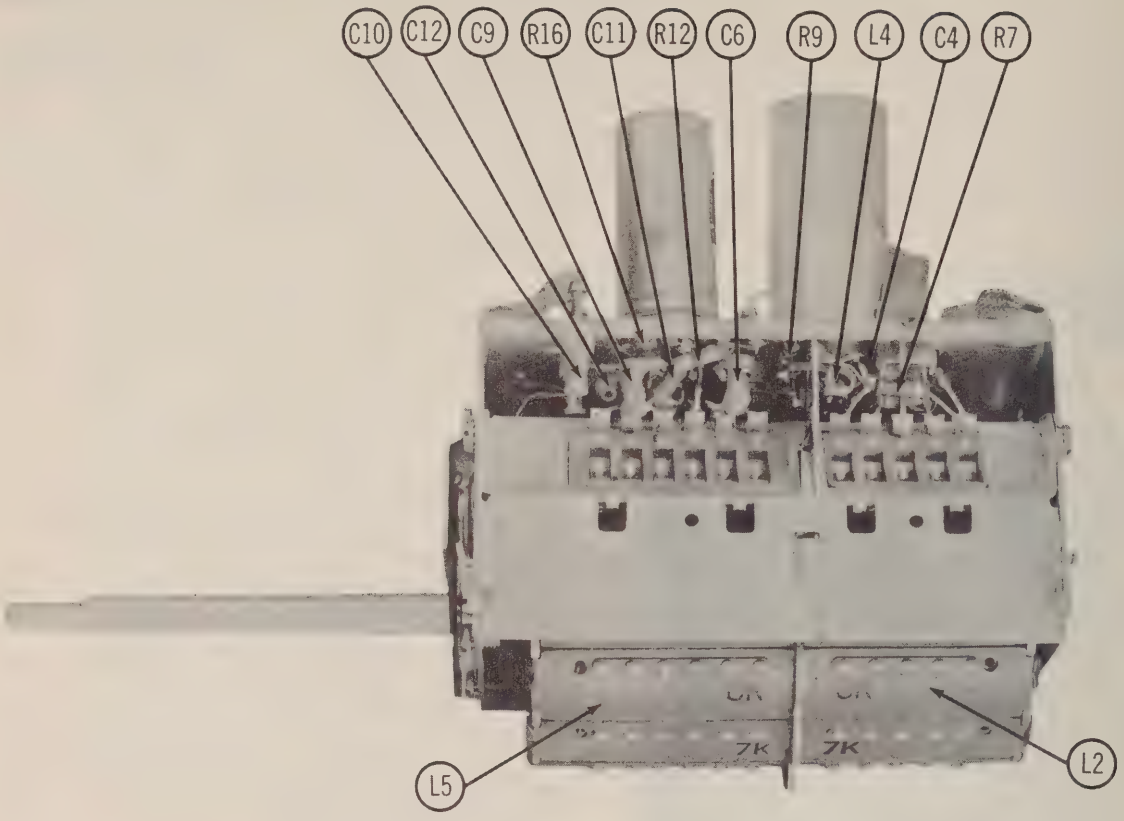


FIG.6

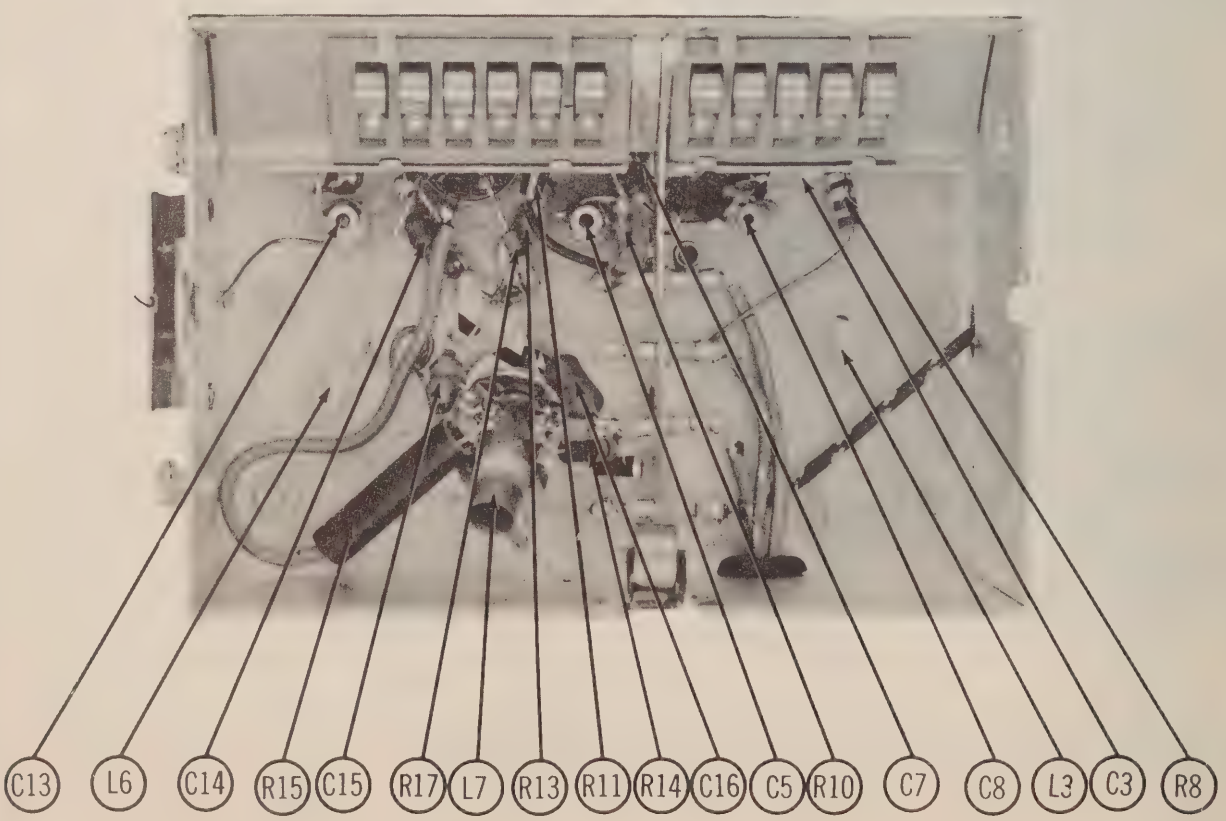
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	2Meg	0Ω	.1Ω	0Ω	†1.5KΩ	110KΩ	INF	0Ω
V 2	6J6	†11KΩ	†11KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1Mgg	0Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	68Ω		
V 4	6CB6	.3Ω	220Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	0Ω		
V 5	6CB6	.3Ω	220Ω	0Ω	.1Ω	†1KΩ	†1.8KΩ	0Ω		
V 6	6AL5	4.7KΩ	4.7KΩ	0Ω	.1Ω	.9Ω	0Ω	1Meg		
V 7	6CB6	1.1Meg	450Ω	.1Ω	0Ω	†6.8KΩ	†1.3KΩ	450Ω		
V 8	6AU6	1Meg	0Ω	.1Ω	0Ω	†1.8KΩ	†1.8KΩ	220Ω		
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	7.5KΩ	0Ω		
V 10	6AL5	0Ω	100KΩ	.1Ω	0Ω	200KΩ	0Ω	100KΩ		
V 11	6AV6	10Meg	0Ω	0Ω	.1Ω	2Meg	0Ω	†220KΩ		
V 12	6V6GT	†10KΩ	.1Ω	†1.8KΩ	†1.5KΩ	470KΩ	†1.2KΩ	0Ω	470Ω	
V 13	12AU7	85KΩ	2.2Meg	0.	0Ω	0Ω	†33KΩ	14KΩ	0Ω	.1Ω
V 14	12AU7	4KΩ	2.3Meg	0Ω	.1Ω	.1Ω	†10Meg	2.4Meg	0Ω	0Ω
V 15	6SN7GT	1.3Meg	#2Meg	2.2KΩ	150Ω	†150KΩ	2.2KΩ	0Ω	.1Ω	
V 16	6W6GT	1.1KΩ	.1Ω	†345Ω	†345Ω	2.2Meg	INF	0Ω	1.6KΩ	
V 17	6SN7GT	1.5Meg	†30KΩ	410KΩ	480KΩ	#90KΩ	0Ω	0Ω	.1Ω	
V 18	6BQ6GT	INF	0Ω	INF	†6.8KΩ	470KΩ	470KΩ	.1Ω	100Ω	TOP CAP #28Ω
V 19	6W4GT	INF	INF	80KΩ	INF	†75Ω	INF	#24Ω	#24Ω	
V 20	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #826Ω
V 21	6AX5GT	INF	.1Ω	27Ω	INF	26Ω	INF	0Ω	10KΩ	
V 22	6AX5GT	INF	.1Ω	27Ω	INF	26Ω	INF	0Ω	10KΩ	
V 23	17BP4A	0Ω	0Ω	PIN 6 0Ω	PIN 10 #490KΩ	PIN 11 270KΩ	PIN 12 .1Ω			

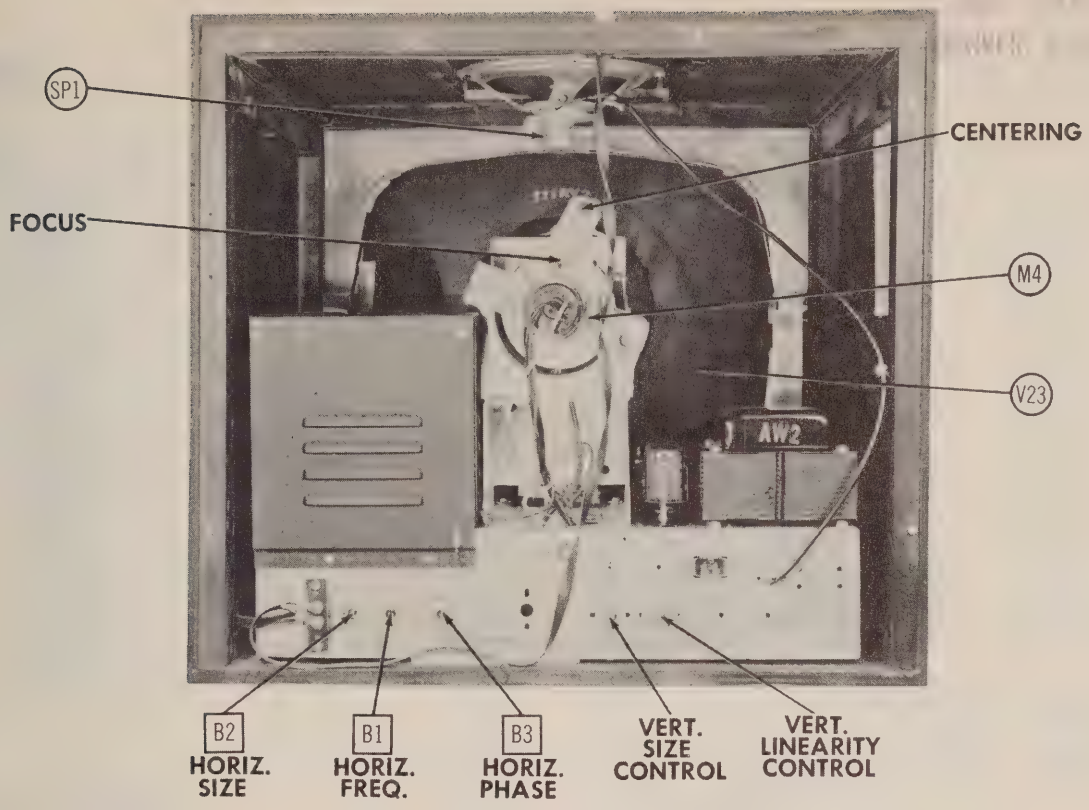
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 8 OF V21 & V22
# MEASURED FROM PIN 3 OF V19



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short across C72.

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to fully counter-clockwise.

Starting with the horizontal frequency slug, (B1), all the way out, adjust inward until picture just falls into sync.

Adjust the horizontal size slug, (B2), if necessary to fill the mask. If picture falls out of sync readjust B1.

Turn the hold control 1/3 turn clockwise.

Adjust the centering until the right hand edge of the picture is visable.

Decrease the contrast and increase the brightness until the normally blanked edge of the raster is visable.

Remove the short from C72.

Adjust the horizontal phase slug, (B3), until the start of the horizontal sync pulse is visable. The sync pulse will appear as a darker bar to the right of the lighter bar which is the blanking signal.

Carefully note the width of the blanking (lighter) bar.

Adjust the phasing slug, (B3), until the sync signal is no longer visable and the blanking bar is reduced to $\frac{1}{2}$ of the original width.

Readjust the centering to center the picture.

FRINGE COMPENSATOR CONNECTION

In weak signal areas where noise of the impulse type is encountered the sync may be improved by the addition of a resistor and capacitor connected to the terminal strip on the top of the chassis. The connections are shown on the schematic.

The parts, mounted on a terminal strip, are available from the manufacturer under part #505024. This change should be made only in weak signal areas since it will cause erratic sync operation on a strong signal.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 6 wood screw for removal of back cover.
3. Disconnect built in antenna and speaker.
4. Remove 2 nut holding speaker. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

Note: For picture tube removal it is necessary to remove chassis as outlined above.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BK7	6BK7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	5CB6	6CB6	7CM	
V6	Video Detector - AGC Rectifier -	6AL5	6AL5	6BT	
V7	Video Output	6CB6	6CB6	7CM	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Limiter	6AU6	6AU6	7BK	
V10	Discriminator	6AL5	6AL5	6BT	
V11	AF Amplifier - AGC Clamper - Noise Limiter	6AV6	6AV6	7BT	
V12	Audio Output	6V6GT	6V6GT	7AC	
V13	Sync.Amplifier - Horiz.Sync.Amp.	12AU7	12AU7	9A	
V14	Vert.Sync.Sep.– Horiz.Sync.Sep.	12AU7	12AU7	9A	
V15	Vert. Multi	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6W6GT	6W6GT	7AC	
V17	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5AX5GT	5AX5GT	6S	
V22	LV Rectifier	5AX5GT	5AX5GT	6S	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: EMERSON PART No	REPLACEMENT DATA: SYLVANIA PART No	RTMA BASE TYPE	NOTES
V23	17BP4A	17BP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	300	925203	PRS450/40-40		UP8445		TVA-2740	Filter (Red)
B	40	300		PRS450/40-40		BR4035		TVA-1716	Filter (Blue)
C	80	300							Filter (Green)
C2A	40	300	925204	AFH4-87		UPT403		TVL-4747	Filter (Red)
B	40	250							Decoupling (Blue)
C	10	450							Decoupling (Yelow)
D	100	50							Vert.Output Cathode (Green)
C3	3-8				829-10				Variable Trimmer
C4	2.2				TCZ-2.2		NP0K-2R2		Neutralizing Cap.
C5	5-3				829-3				Variable Trimmer
C6	1000			BPD-001	DD-102	TM5D1	B01-001	5HK-D1	RF Amp. Plate Dec. †
C7	1000			BPD-001	DD-102	TM5D1	B01-001	5HK-D1	RF Amp.Grid Dec.
C8	1000			BPD-001	DD-102	TM5D1	B01-001	5HK-D1	RF Amp.Fil.Bypass
C9	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C10	5-3				829-3				Variable Trimmer
C11	10			SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C12	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C13	5-3				829-3				Variable Trimmer
C14	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Conv.Fil.Bypass
C15	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C16	1000			SI1000	D6-102	TM-5D1	GP2L-102	5HK-D1	Mixer Plate Dec.
C17	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	AGC Filter
C18	10		928078	SI10	D6-100	SW5Q1	GP1K-100	5GA-Q1	IF Coupling
C19	82	500			829-3				Fixed Trimmer
C20	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	AGC Filter
C21	.25	200	921330	P488-25				P2P25	2TM-P25 AGC Filter
C22	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	1st. Video IF Dec.
C23	47			SI47NP0	TCZ-47		NP0K-470	5TCC-Q47	Fixed Trimmer
C24	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	2nd. Video IF Dec.
C25	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	2nd. Video IF Cathode
C26	62				TCN-62		N750K-620		Fixed Trimmer
C27	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	3rd. Video IF Plate
C28	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	3rd. Video IF Screen
C29	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	3rd. Video IF Cathode
C30	25		928110	SI25	D6-250	SW5Q25	GP1K-250	5GA-Q25	IF Coupling
C31	.25	200	921330	P488-25				P2P25	AGC Filter
C32	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Video Det.Fil.Bypass
C33	5		928017	SI5NP0	TCZ-4.7		NP0K-050		Video Det. Filter
C34	.047	400	922554	P488-047	DF-503	PTE4S47		4TM-S47	Video Coupling
C35	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Video Output Screen
C36	.047	400	922554	P488-047	DF-503	PTE4S47		4TM-S47	Video Coupling
C37	.01	600	921714	P888-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Accelerating Anode Bypass
C38	5000		928109	BPD-005	DD-502	TM5D1	B1-005	5HK-D5	AVC Filter
C39	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Sound IF Decoupling
C40	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Sound IF Cathode Bypass
C41	5000		928109	BPD-005	LG-502	TM5D5	B1-005	5HK-D5	Sound IF Fil.Bypass
C42	68	500	910221	1469-00007	D6-680	SW5Q7	GP1K-680	M68-47	Limiter Grid Filter
C43	5000		928109	BPD-005	DD-502	TM5D5	B1-005	5HK-D5	Limiter Plate Dec.
C44	1500		928006	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Limiter Screen Bypass
C45	50	500	910322	1468-00005	D6-500	SW5Q5	GP1K-500	1FM-45	Diode Load Cap.
C46	.001	600	921713	P888-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-emphasis
C47	.01	400	921514	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C48	.005	600	921753	P888-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C49	.001	600	921713	P888-001	D6-102	PTE6D1	GP2L-102	6TM-D1	AF Amp. Plate Bypass
C50	.047	400	922554	P488-047	DF-503	PTE4S47		4TM-S47	Audio Coupling
C51	.005	600	921753	P888-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C52	.01	600	922041	P888-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling *

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C53	.047	400	922554	P488-047	DF-503	PTE4S47		4TM-S47	Sync. Coupling
C54	110	500	910043	1469-0001		SR5T1		MS-S1	Sync.Coupling
C55	110	500	910043	1469-0001		SR5T1		MS-S1	Sync.Coupling *
C56	47	500	910058	1469-00005		SR5Q5		MS-45	Vert.Sync.Sep.Grid
C57	.047	400	922554	P488-047	DF-503	PTE4S47		4TM-S47	Vert.Sync.Coupling
C58	.0047	400	922453	P488-0047	D6-472	PTE2D47	GP2-333-472	2TM-D47	Vert.MV Feedback
C59	.05	200	921554	P288-05	DF-503	PJ2S5		2TM-S5	Vert.MV Cathode
C60	.047	600	922654	P688-047		PTE6S47		6TM-S47	Vert.Discharge
C61	.1	400	922715	P488-1	DF-104	PTE4P1		4TM-P1	Vert.Sweep Coupling
C62	.01	400	922514	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert.Sweep Coupling
C63	.01	400	922514	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz.Sync.Coupling
C64	.02	600	910056	SI02			GP1K-820		Horiz.Sync.Coupling
C65	82	500	910058	SI82			GP1K-820		Horiz.Feedback
C66	25		928110	SI25	D6-250	SW5Q25	GP1K-250	5GA-Q25	Voltage Divider
C67	.05	400	921554	P488-05	DF-503	PTE4S5		4TM-S5	Horiz.AFC Filter
C68	.5	200	921355	P288-5		PJ2P5		2TM-P5	Horiz.AFC Filter
C69	.02	400	921324	P488-02	DF-203	PTE4S2		4TM-S2	Horiz.AFC Filter
C70	.05	400	921554	P488-05	DF-503	PTE4S5		4TM-S5	Horiz.AFC Plate
C71	220	1000	910087						Horiz.Osc.Grid Cap.
C72	.01	600	922041	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C73	820	500	910218						Horiz.Discharge
C74	330	500	910059	1469-00035					Horiz.Sweep Coupling
C75	100	500	910100	1468-0001	D6-101	SW5T1	GP1K-101	1FM-31	Horiz.Output Grid
C76	.1	400	921515	P488-1	DF-104	PTE4P1		4TM-P1	Horiz.Output Screen
C77	.1	200	921315	P288-1	DF-104	PJ2P1		2TM-P1	Horiz.Output Cathode
C78	300	2000	928068						Damper Fil.Bypass
C79	.1	600	922715	P688-1		PTE6P1		6TM-P1	Damper Filter
C80	.033	1000	922834	P1068-033					Horiz.Sweep Coupling
C81	.1	200	921315	P288-1	DF-104	PTE4P1		4TM-S1	Bias Filter
C82	.047	400	922200	492ZGXY-*5		PJ4S5		4TM-S47	Line Filter
C83	.047	400	922200	492ZGXY-D5		PJ4S5		4TM-S47	Line Filter

* Not used in all Models
† Some Models use 120MMF in this application

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	390184	Concentrikit B17-110 *	RTV-296	SBB-701-8	Contrast Control – Panel
B	1Meg	½		B13-137 *			Volume Control – Rear
C	Shaft end		Not Req.	E187 *	Not Req.		Attach per instructions in Concentrikit
C	Switch		Not Req.	76-1 *	Not Req.		Attach per instructions in Concentrikit
R2A	200KΩ	½	390191	Qil-139	AG-52-5	B-46	Brightness Control
B	Shaft		Not Req.	Not Req.	R8-2	Not Req.	Attach to R2A per instructions
R4A	1Meg	½	390183	Qil-137	AG-61-8	AN-69	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	R8-3	AE-4	Attach to R4A per instructions
R5	5000	2	390143	W-5000	43-5000	VE-135	Vert. Linearity Control – Wire Wound
R6A	2Meg	½	390142	Qil-139	AG-83-8	AN-75	Vert. Size Control
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Attach to R6A per instructions

* Additional Parts to be used with Concentrikit

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES: ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R7	22KΩ	½			Antenna Coil Shunt
R8	47KΩ	½		BTS-47K	AGC Network
R9	220KΩ	½			RF Amp. Grid
R10	220KΩ	20% ½		BTS-220K	Voltage Divider
R11	1000Ω	20% ½		BTS-1000	RF Amp. Plate Decoupling
R12	4700Ω	½		BTS-4700	Mixer Grid
R13	220KΩ	½			Mixer Grid
R14	10KΩ	½			Mixer Plate
R15	10Ω	½			Parasitic Suppressor
R16	10KΩ	½			Osc. Grid
R17	10KΩ	½			Osc. Plate
R18	220Ω	½	340332	BTS-220	Decoupling
R19	470Ω	20% ½	350412	BTS-470	Decoupling
R20	470Ω	20% ½	350412	BTS-470	AGC Network
R21	470Ω	20% ½	350412	BTS-470	AGC Network
R22	1Meg	20% ½	351212	BTS-1Meg	AGC Network
R23	5600Ω	½	340672	BTS-5600	1st. Video IF Coil Shunt
R24	68Ω	½	340212		1st. Video IF Amp. Cathode
R25	470Ω	20% ½	350412	BTS-470	1st. Video IF Amp. Decoupling
R26	15KΩ	½	340772		2nd. Video IF Coil Shunt
R27	220Ω	½	340332	BTS-220	2nd. Video IF Amp. Cathode
R28	470Ω	20% ½	350412	BTS-470	2nd. Video IF Amp. Decoupling
R29	6800Ω	½	340712		3rd. Video IF Coil Shunt
R30	220Ω	½	340332	BTS-220	3rd. Video IF Amp. Cathode
R31	470Ω	20% ½	350412	BTS-470	3rd. Video IF Amp. Screen
R32	1000Ω	½	340492	BTS-1000	3rd. Video IF Amp. Plate Decoupling
R33	1Meg	20% ½	351212	BTS-1Meg	AGC Network
R34	1Meg	20% ½	351212	BTS-1Meg	AGC Network
R35	4700Ω	½	340852	BTS-4700	Video Det.Diode Load
R36	33KΩ	½	340852	BTS-33K	Peaking Coil Shunt
R37	22KΩ	½	340812	BTS-22K	Video Peaking Coil Shunt
R38	6800Ω	5% ½	770692	BTS-6800 5%	Video Output Plate
R39	220KΩ	½	341052	BTS-220K	Vert. Blanking Network
R40	470KΩ	½	351132	BTS-470K	Picture Tube Cathode
R41	470KΩ	20% ½	351132	BTS-470K	Voltage Divider
R42	15KΩ	½	340772	BTS-15K	Sound IF Coil Shunt
R43	220Ω	½	340332	BTS-220	Sound IF Amp. Cathode
R44	470Ω	20% ½	350412	BTS-470	Sound IF Amp. Decoupling
R45	1Meg	20% ½	351212	BTS-1Meg	AVC Network
R46	47KΩ	½	340892		Limiter Grid
R47	15KΩ	½	340772		Limiter Screen
R48	10KΩ	½	340732		Limiter Screen

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No	IDENTIFICATION CODES
R49	10KΩ	½	340732	BTS-10K	Voltage Divider
R50	10Meg 20%	½	351432	BTS-10Meg	Delayed AGC Network
R51	470Ω 20%	½	350412	BTS-470	Limiter Decoupling
R52	100KΩ	½	340972	BTS-100K	Sound Discr. Diode Load
R53	100KΩ	½	340972	BTS-100K	Sound Discr.Diode Load
R54	68KΩ	½	340932		De-emphasis
R55	10Meg 20%	½	351452	BTS-10Meg	AF Amp. Grid
R56	220KΩ	½	341052	BTS-220K	AF Amp. Plate
R57	470KΩ 20%	½	351132	BTS-470K	Output Grid
R58	470Ω	1	370042	BTA-470	Output Cathode
R59	1500Ω 20%	2	790132	BTB-1500	Output Decoupling.
R60	10KΩ	½	340732	BTS-10K	Sync. Amp. Grid
R61	33KΩ	½	370852	BTA-33K	Sync. Amp. Plate
R62	1Meg 20%	½	351212	BTS-1Meg	Video Output Grid
R63	100KΩ	½	340972	BTS-100K	Vert.Sync. Seperator Grid
R64	10Meg 20%	½	351452	BTS-10Meg	Vert.Sync. Seperator Plate
R65	150Ω	½	340292	BTS-150	Vert. MV Grid
R66	820KΩ	½	341192	BTS-820K	Vert. MV Grid - See Note 1
R67	2200Ω	½	340572	BTS-2200	Vert. MV Cathode
R68	150KΩ	½	341012	BTS-150K	Vert. MV Plate
R69	1.5Meg	½		BTS-1.5Meg	Vert. MV Plate - See Note 2
R70	12KΩ	½	340752	BTS-12K	Vert. Peaking
R71	2.2Meg	½	341292	BTS-2.2Meg	Vert. Output Grid
R72	470Ω 20%	½	350412	BTS-470	Vert. Output Cathode
R73	470KΩ 20%	½	351132	BTS-470K	Accelerating Anode Load
R74	12KΩ	½	340752	BTS-12K	Voltage Divider
R75	27KΩ	1	370832	BTA-27K	Horiz.Sync. Amp. Plate
R76	2.2Meg	½	341292	BTS-2.2Meg	Horiz.Sync. Amp. Grid
R77	22KΩ	1	370812	BTA-22K	Horiz. Sync. Seperator Plate
R78	2.2Meg	½	341292	BTS-2.2Meg	Horiz. Sync. Seperator Grid
R79	4700Ω	½	340852	BTS-4700	Voltage Divider
R80	10KΩ	½	340732	BTS-10K	Voltage Divider
R81	100KΩ	½	340972	BTS-100K	Voltage Divider
R82	330KΩ	½	341092	BTS-330K	Horiz. AFC Grid
R83	820KΩ	½	341192	BTS-820K	Horiz. AFC Grid
R84	82KΩ	½	340952	BTS-82K	Horiz. AFC Cathode
R85	3900Ω	½	340632	BTS-3900	Horiz. AFC Filter
R86	82KΩ	1	370952	BTA-82K	Voltage Divider
R87	100KΩ	½	340972	BTS-100K	Feedback Network
R88	100KΩ	½	340972	BTS-100K	Feedback Network
R89	68KΩ	½	340932	BTS-68K	Horiz. Osc. Plate
R90	330KΩ 5%	½	331092	BTS-330K 5%	Horiz. AFC Cathode
R91	150KΩ 5%	½	331012	BTS-150K 5%	Horiz. Osc. Grid
R92	8200Ω	½	340712	BTS-8200	Horiz. Osc. Coil Shunt
R93	56Ω	½	340213		Parasitic Suppressor
R94	470KΩ	½	341132	BTS-470K	Horiz. Output Grid
R95	100Ω	1	780252		Horiz. Output Cathode
R96	68000Ω	2	780432	5TB-6800	Horiz. Output Screen
R97	22KΩ	½	340812	BTS-22K	Voltage Divider
R98	1250Ω	10	394116	1 3/4A-1250	Filter – Wire Wound
R99	8.5Ω	5	394122		Bias Network – Wire Wound
R100	100KΩ	½	340972	BTS-100K	Bias Network – Wire Wound
R101	100KΩ	½	370972	BTA-100K	Isolation
R102	3.3Meg	½		BTS-3.3Meg	Noise Limiter Load - See Note 3

Note 1. Some Models use a 1Meg Resistor in this application
Note 2. Some Models use a 680KΩ Resistor in this application
Note 3. Not used in all Models

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.65A	530VCT @ .235ADC	12.6VCT @ 5.6A	5.3VAC @ 1.2A	730032	P-8169 ①	P-3066 ①	

① Add Series Resistor to Reduce High Voltage

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	876Ω Tapped @ 5Ω 4Ω 4Ω 5Ω 76Ω	0Ω	738060				Horiz. Output Trans.
T3	270Ω Tapped @ 90		738059	A-8140 ③	A-3081 ③		Vert. Output Trans.
T4	58Ω 3.5Ω		708135 708073 ④ 708150 ⑤	DY-10	MDF-50		Hor. Deflection Coils Vert. Deflection Coil

② Drill New Mounting Holes
③ Select windings to give a 30 to 1 turns ratio
④ Alternate Deflection Yoke
⑤ Alternate Deflection Yoke. When used to replace either 708135 or 708073, a 1500Ω ½ watt resistor must be inserted between terminal 8 of T4 and one end of 270MMF capacitor in T4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T5	5.2KΩ	3.6Ω	330Ω	7Ω	734051	A-3823	A-3019	RO-303	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.6Ω	180041C 180041 ⑥ 180050 ⑥ 180082 ⑥	ST-108 Mod. P6-X	6A1	⑥ Alternate Speaker
	CONE DIA.	V. C. DIA.				
SP1B	6"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.235ADC	75Ω	1.5Henries	737016	C-2326 ⑦	C-2991 ⑦	TR-3300⑦	⑦ Drill One New Mounting Hole

COILS (RF-IF)

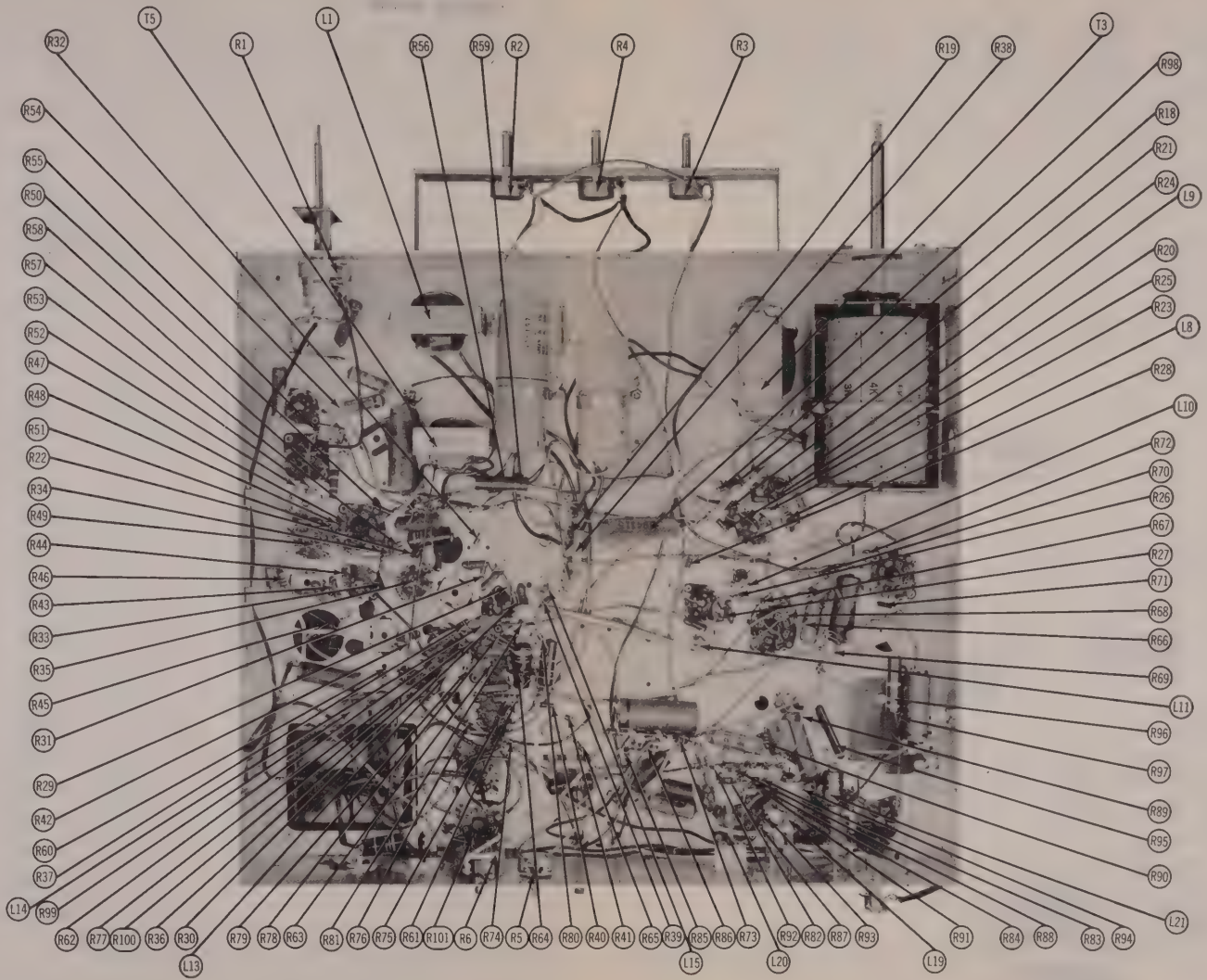
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MERIT PART No.	
L2	Ant. Coils	0Ω				
L3	Fil. Choke	0Ω				
L4	RF Choke	0Ω				
L5	RF, Mixer Grid & Osc. Coils	0Ω				
L6	Fil. Choke	0Ω				
L7	Conv. Plate	.5Ω	0Ω			
L8	1st. Video IF	.1Ω	.5Ω	720131		
L9	21.25MC Sound Trap	0Ω				
L10	2nd. Video IF	.3Ω	.3Ω	720139		Includes 27.25MC Trap
L11	3rd. Video IF	.2Ω	.2Ω	720133		Includes 21.25MC Trap
L12	4th. Video IF	.8Ω	.8Ω	720127		
L13	Peaking Coil	10.6Ω		708100		250 Microhenries
L14	Peaking Coil	10.6Ω		708100		250 Microhenries
L15	Peaking Coil	15Ω		708114		440 Microhenries
L16	1st. Sound IF	9.5Ω	2.2Ω	720141 or 720142		
L17	2nd. Sound IF	1.6Ω	1.6Ω	720081 or 720081A		
L18	Discr. Trans.	2.1Ω	2.3Ω	708018 or 708017		Tap ⓐ 1.2Ω
L19	Horiz. Osc.	110Ω		716052		Tap ⓐ 33Ω
L20	Horiz. Phase	29.5Ω		738065		
L21	Horiz. Size	5Ω		708068		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMERSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Pigtail	½A. 250V.			318.500		GJV-½	

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2	RF Tuner	470681	
M3	Focus Magnet	470660	
M4	Ion Trap	708061	
	Knob	450138	Contrast
	Knob	450137	Fine Tuning
	Knob	450134	Off/On Volume (Shank)
	Knob	460262	Off/On Volume (Flange)
	Knob	450133	Channel Selector (Shank)
	Knob	460261	Channel Selector (Flange)



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MODELS 17C113, 17C115, 17C120

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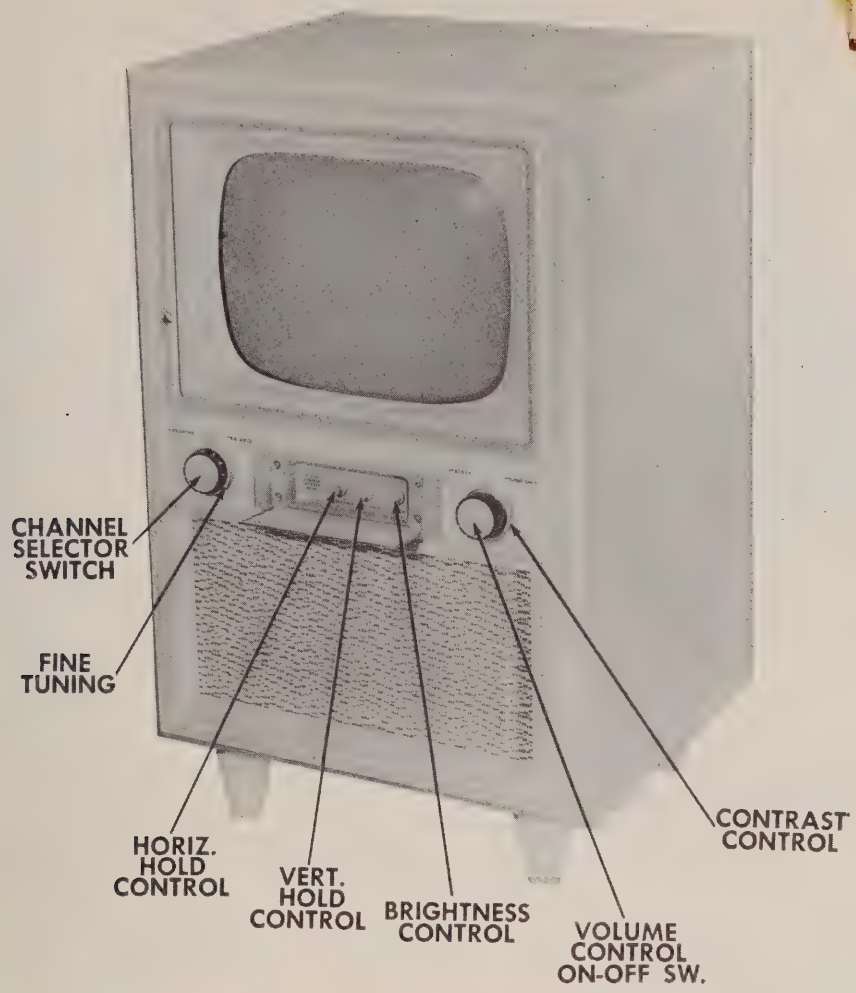
DATE 5-52 SET 166 FOLDER 10

PHOTOFACT* Folder

*TRADE MARK

GENERAL ELECTRIC
MODELS 17C113, 17C115, 17C120

PROPERTY OF



GENERAL ELECTRIC
MODELS 17C113, 17C115, 17C120

GENERAL ELECTRIC MODEL 17C113

TRADE NAME	General Electric Models 17C113, 17C115, 17C120
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty One

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.5 Amp. @ 117 Volts
TUNING RANGE—CHANNELS 2 thru 13

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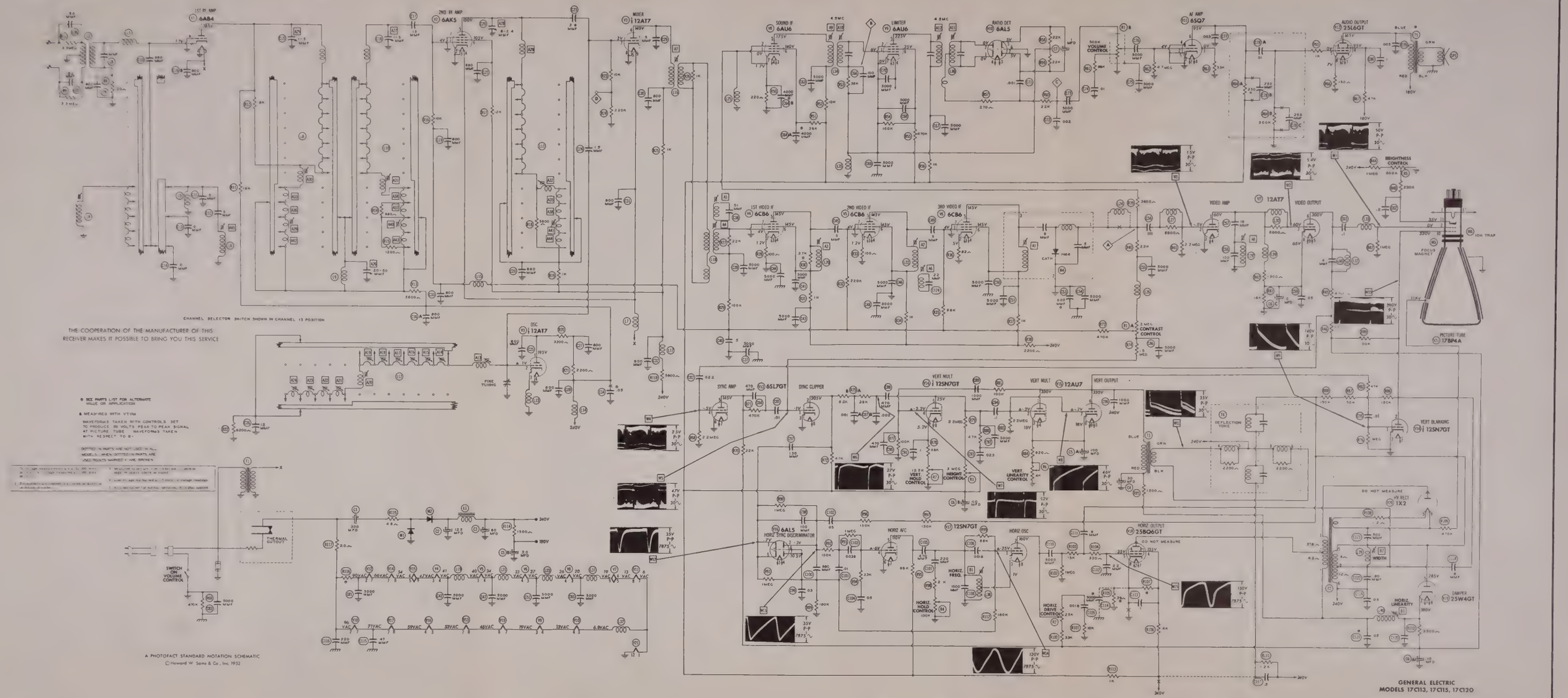
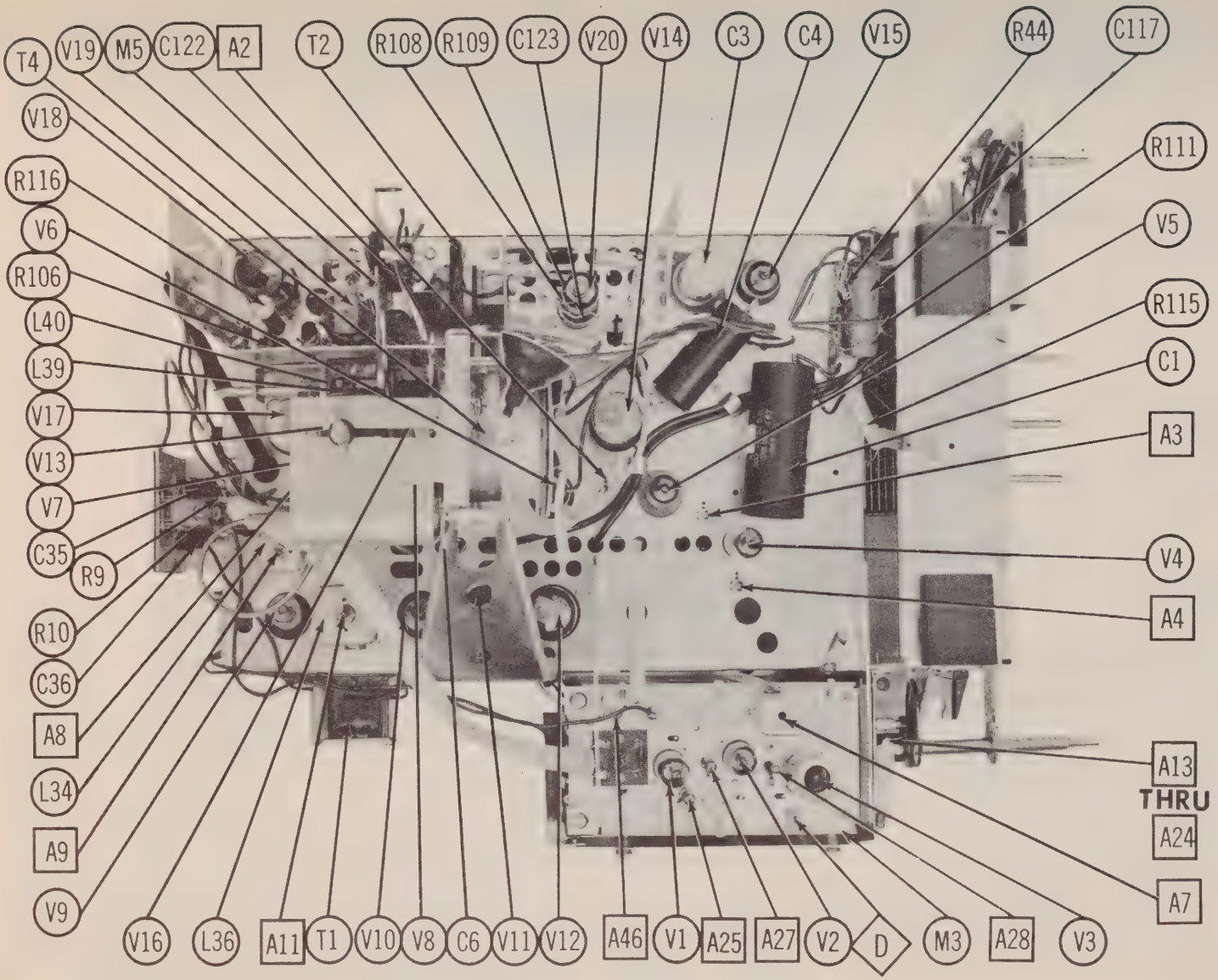
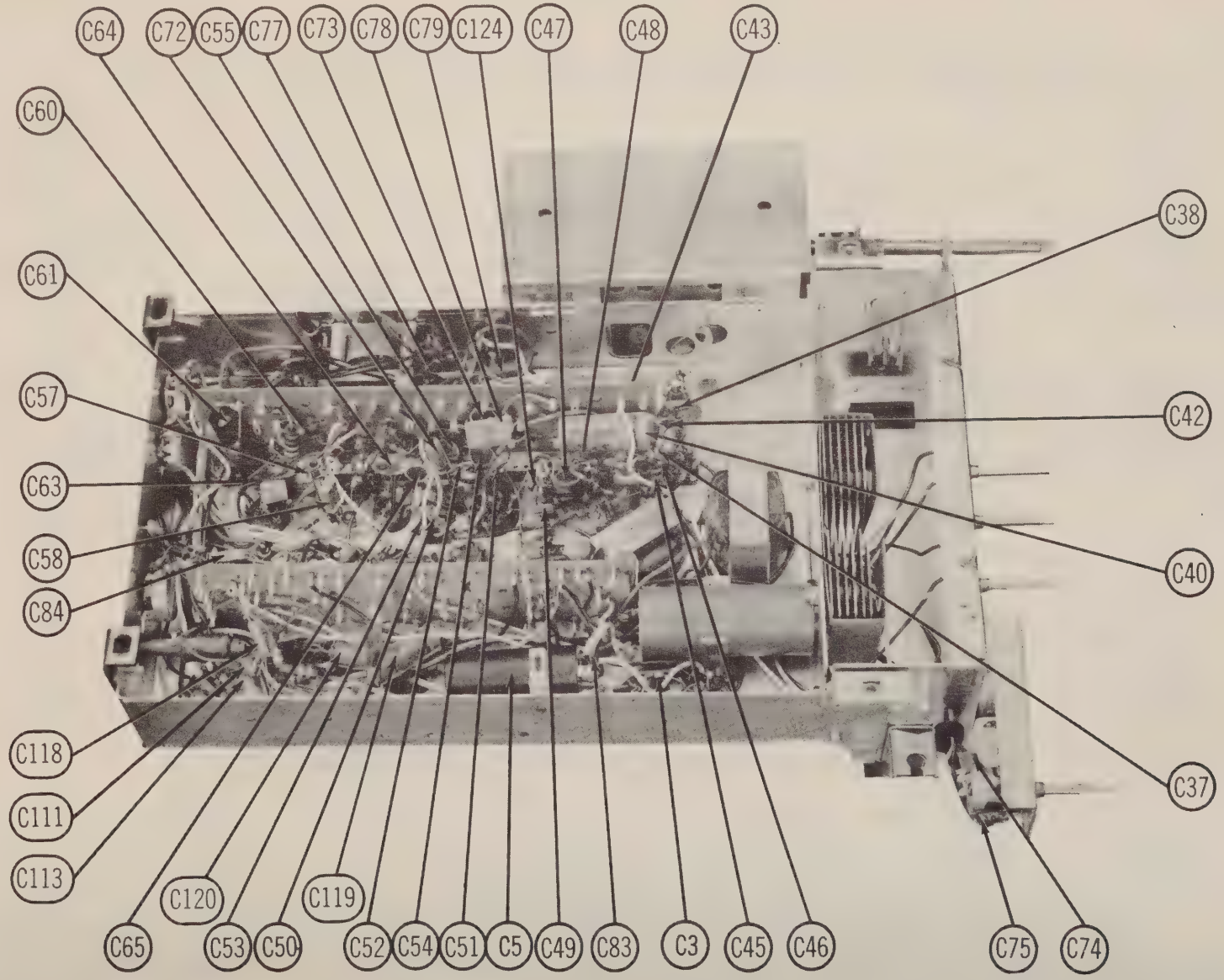

GENERAL ELECTRIC
MODELS 17C113, 17C115, 17C120
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1952
1ST RF AMP 6AB4
2ND RF AMP 6AK5
MIXER 12AT7
OSC 12AT7
SOUND IF 6AU6
LIMITER 6AU6
RATIO DET 6AL5
AF AMP 6SQ7
AUDIO OUTPUT 25L6GT
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
VIDEO AMP 12AT7
VIDEO OUTPUT
PICTURE TUBE 17BP4A
SYNC AMP 6SL7GT
SYNC CLIPPER
VERT MULT 12SN7GT
VERT MULT 12AU7
VERT OUTPUT
VERT BLANKING 12SN7GT
6AL5 HORIZ SYNC DISCRIMINATOR
HORIZ AFC
HORIZ OSC 12SN7GT
HORIZ OUTPUT 25BQ6GT
HV RECT 1X2
DAMPER 25W4GT
BRIGHTNESS CONTROL
CONTRAST CONTROL
VERT HOLD CONTROL
VERT LINEARITY CONTROL
HEIGHT CONTROL
HORIZ. FREQ.
HORIZ HOLD CONTROL
HORIZ DRIVE CONTROL
WIDTH
HORIZ. LINEARITY
FOCUS MAGNET
ION TRAP
FINE TUNING
THERMAL CUTOUT
SWITCH ON VOLUME CONTROL
500K VOLUME CONTROL
DO NOT MEASURE
GENERAL ELECTRIC
MODELS 17C113, 17C115, 17C120

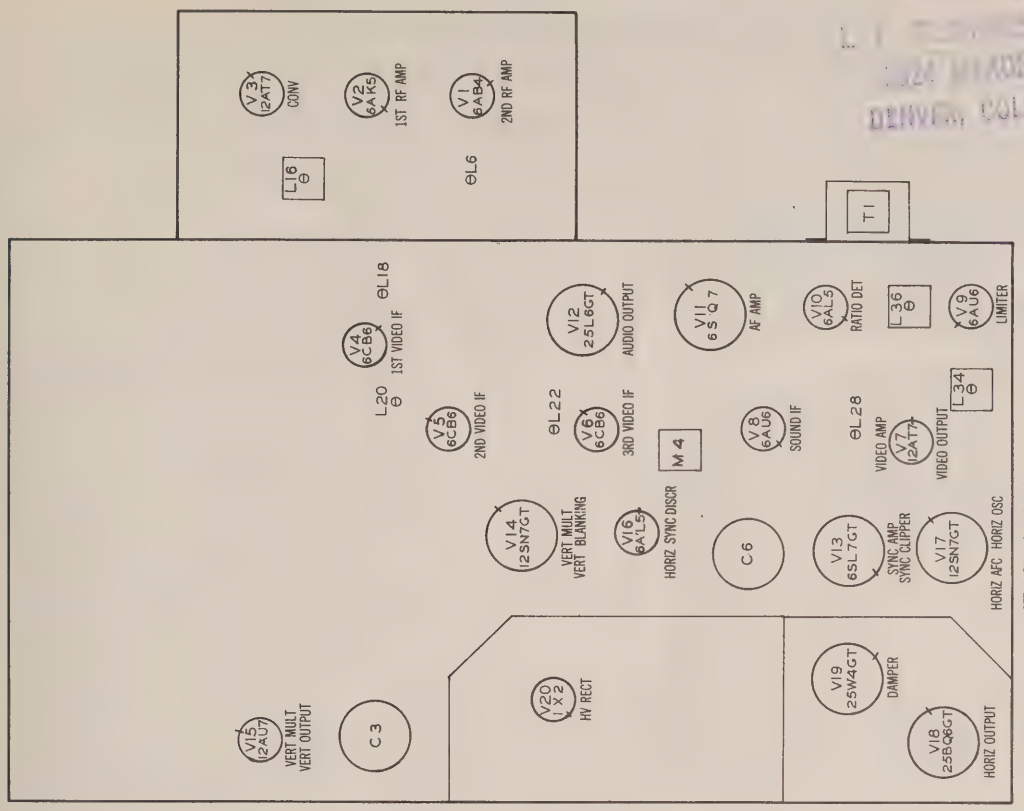


CHASSIS TOP VIEW

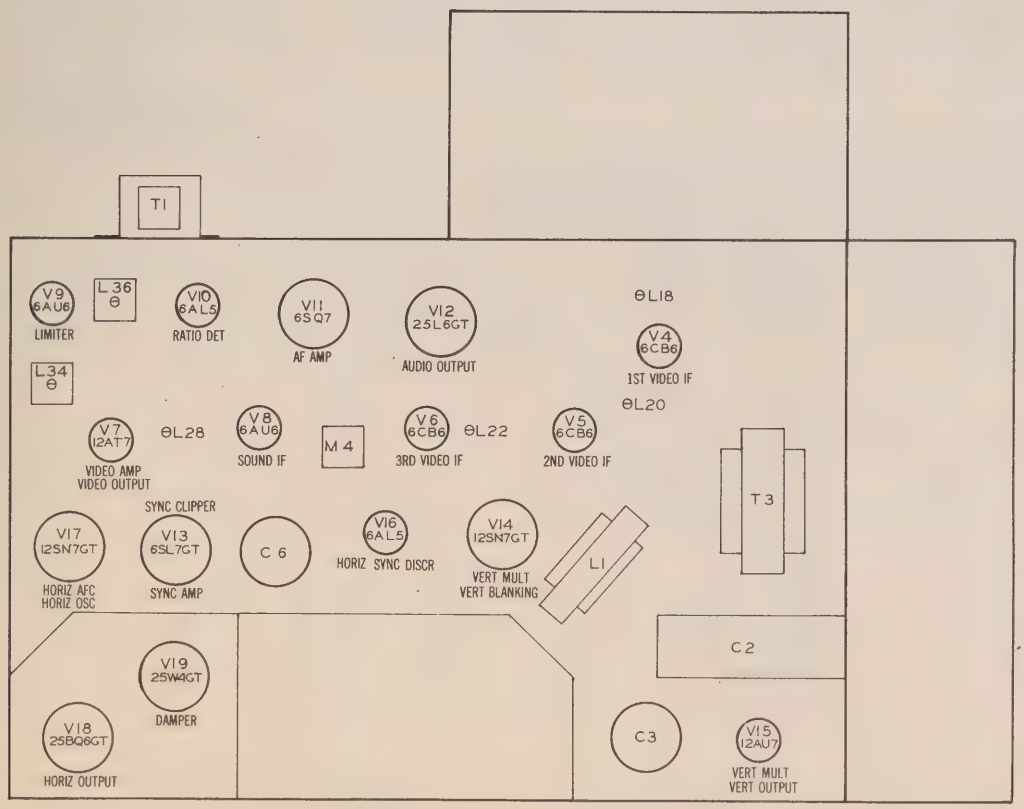


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

...RY OF
L I ...ERSHIP
...MADE ST.
DENVER, COLORADO



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The picture tube must be removed for alignment. To complete the filament string short pins 1 and 12 of the picture tube socket.
The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal output tube to disable the high voltage.

VIDEO IF ALIGNMENT

Tune to a channel which causes no spurious interference. To check for interference turn the fine tuning control, if the response curve changes, switch to another channel.
Connect the negative lead of a 4.5 volt battery to the junction of R74, C86 and the contrast control, connect the positive lead to B- .
Connect a VTVM between Pin 1 (grid) of 6CB6 (V4) and B- . Adjust the contrast control until the VTVM reads -3 volts. Remove the VTVM.
Detune the traps A5 & A6 by turning the cores completely out of the coils, (counter-clockwise).
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to Pin 1, (grid) of 6CB6, (V6). Low side to B- .	45MC (10MC swp.)	42.5MC 45MC	See Note above	Vert. amp. thru 10KΩ to Point (A). Low side to chassis.	A1	Connect a short across A2. Adjust for response curve similar to Fig. 1.
2.	"	High side to Pin 1, (grid), of 6CB6, (V5). Low side to B- .	"	45.75MC	"	"	A2	Remove short from A2 and short A3. Adjust for response curve similar to Fig. 2.
3.	"	High side to Pin 1, (grid) of 6CB6, (V4). Low side to B- .	"	42.5MC 45.75MC	"	"	A3	Remove short from A3. Adjust for response curve similar to Fig. 3.
4.	"	High side to Point (D). Low side to B- , (tuner chassis).	"	42.5MC 45MC 45.75MC	"	"	A4	Adjust for response cruve similar to Fig. 4.
5.	"	"	"	47.25MC	"	"	A5, A6	Adjust for MINIMUM marker indication at the 47.25MC point on response curve.
6.	"	"	"	41.25MC 42.5MC 45MC 45.75MC 47.25MC	"	"	A7	Adjust for response curve similar to Fig. 5. If necessary retouch A1 thru A4 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to Point (A). Low side to B- .	4.5MC (1MC swp.)	4.5MC	See Note above video align.	Vert. amp. thru detector (Fig. 6), to junction of L33 & C61. Low side to B- .	A8	Adjust for MINIMUM marker indication on response curve.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to Pin 1, (grid) of 6AU6 (V8). Low side to chassis.	4.5MC (500KC swp.)	4.5MC	See note above video align.	Vert. amp. thru 10KΩ to Point (B). Low side to B- .	A9, A10	Adjust for maximum amplitude & symmetry as per Fig. 7.
9.	"	"	"	"	"	Vert. amp. to Point (B). Low side to B- .	A11, A12	Adjust A11 so 4.5MC occurs at center of "S" curve as per Fig. 8. Adjust A12 for max. amplitude & straightness of diagonal portion with symmetrical peaks. If necessary re-adjust A11 to place marker at center of curve.

AFTER ALIGNMENT IS COMPLETED AND SET RESTORED TO ORIGINAL OPERATION, CHECK FOR INTERCARRIER BUZZ ON ALL AVAILABLE STATION. IF NECESSARY RETOUCH A10 FOR MINIMUM INTERCARRIER BUZZ.

OSCILLATOR ALIGNMENT

Leave the bias battery connected and the contrast control adjusted as during video IF alignment.
Turn the fine tuning control to fully counter-clockwise and then 1/2 turn clockwise. This position represents mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	See Fig. 9	Across antenna terminals.	213MC (10MC swp.)	211.25MC	13	Vert. amp. thru 10KΩ to Point (A). Low side to B- .	A13	Adjust to place video marker at 50% on high frequency slope of response.
			207MC (10MC swp.)	205.25MC	12		A14	
			201MC (10MC swp.)	199.25MC	11		A15	
			195MC (10MC swp.)	193.25MC	10		A16	
			189MC (10MC swp.)	187.25MC	9		A17	
			183MC (10MC swp.)	181.25MC	8		A18	
			177MC (10MC swp.)	175.25MC	7		A19	
			85MC (10MC swp.)	83.25MC	6		A20	
			79MC (10MC swp.)	77.25MC	5		A21	
			69MC (10MC swp.)	67.26MC	4		A22	
			63MC (10MC swp)	61.25MC	3		A23	
			57MC (10MC swp.)	55.25MC	2		A24	

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Disconnect the red lead from the center terminal of the terminal strip on the rear of the tuner, this will disable the local oscillator.
Leave the bias battery connected and adjust the contrast control to read - 3 volts between the tuner AGC lead and B- .
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	See Fig. 9	Across antenna terminals.	213MC (15MC swp.)	211.25MC 215.75MC	13	Vert. amp. to Point◇ Low side to B- .	A25, A26 A27, A28	Adjust for maximum amplitude of response similar to Fig. 10.
12.	"	"	207MC (15MC swp.)	205.25MC 209.75MC	12	"		Check all high band channels for response similar to Fig. 10. If necessary expand or compress turns of A29 for compromise which gives best response across the high band channels.
			201MC (15MC swp.)	199.25MC 203.75MC	11			
			195MC (10MC swp.)	193.25MC 197.75MC	10			
			189MC (10MC swp.)	187.25MC 191.75MC	9			
			183MC (10MC swp.)	181.25MC 185.75MC	8			
			177MC (10MC swp.)	175.25MC 179.75MC	7			
13.	"	"	85MC (15MC swp.)	83.25MC 87.75MC	6	"	A30, A31 A32, A33	Adjust for maximum amplitude of response similar to Fig. 10.
14.	"	"	79MC	77.25MC 81.75MC	5	"	A34, A35 A36	Check for response curve similar to Fig. 10. If necessary expand or compress coil turns for proper response.
15.		"	69MC (15MC swp.)	67.25MC 71.75MC	4	"	A37, A38 A39	"
16.	"	"	63MC	61.25MC 65.75MC	3	"	A40, A41 A42	Adjust for response curve similar to Fig. 10 with optimum flattness of top portion.
17.	"	"	57MC	55.25MC 59.75MC	2	"	A43, A44 A45	Check for response similar to Fig. 10. If necessary expand or compress coil turns for proper response.

IF TRAP ADJUSTMENT

If interference caused by a signal within the IF range causes interference, the trap A46 may be adjusted to minimize it. If the frequency of the interfering signal is known the trap may be adjusted with an oscilloscope. Connect a sweep generator across the antenna terminals and adjust it to sweep 40 to 50MC. Connect an oscilloscope to Point◇ & B- .
Feed in a marker signal at the interfering signal frequency and adjust A46 for minimum marker on the response curve.
Care should be exercised when tuning the trap since tuning it too high in frequency will impair operation on channel 2.

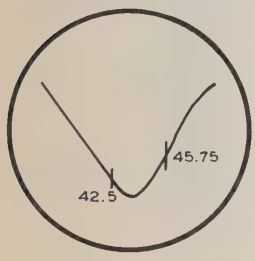


FIG.1

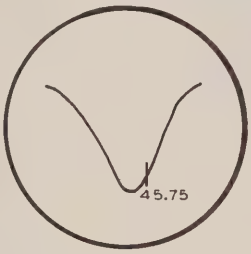


FIG.2

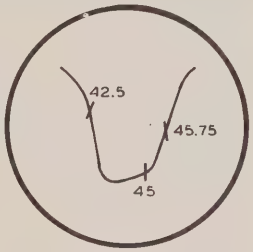


FIG.3

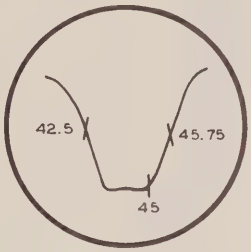


FIG.4

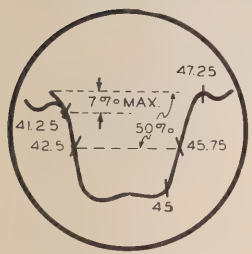


FIG.5

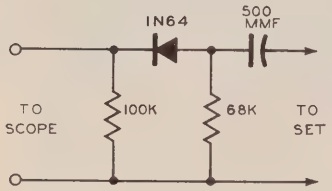


FIG.6

FIG.7

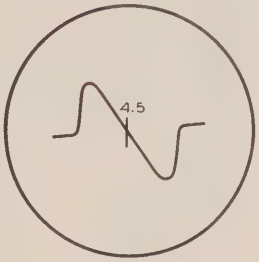
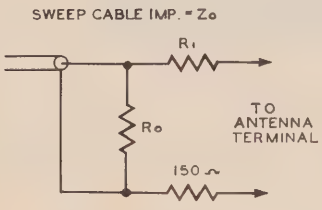


FIG.8



Z_o	R_o	R_1
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω
92Ω	110Ω	100Ω

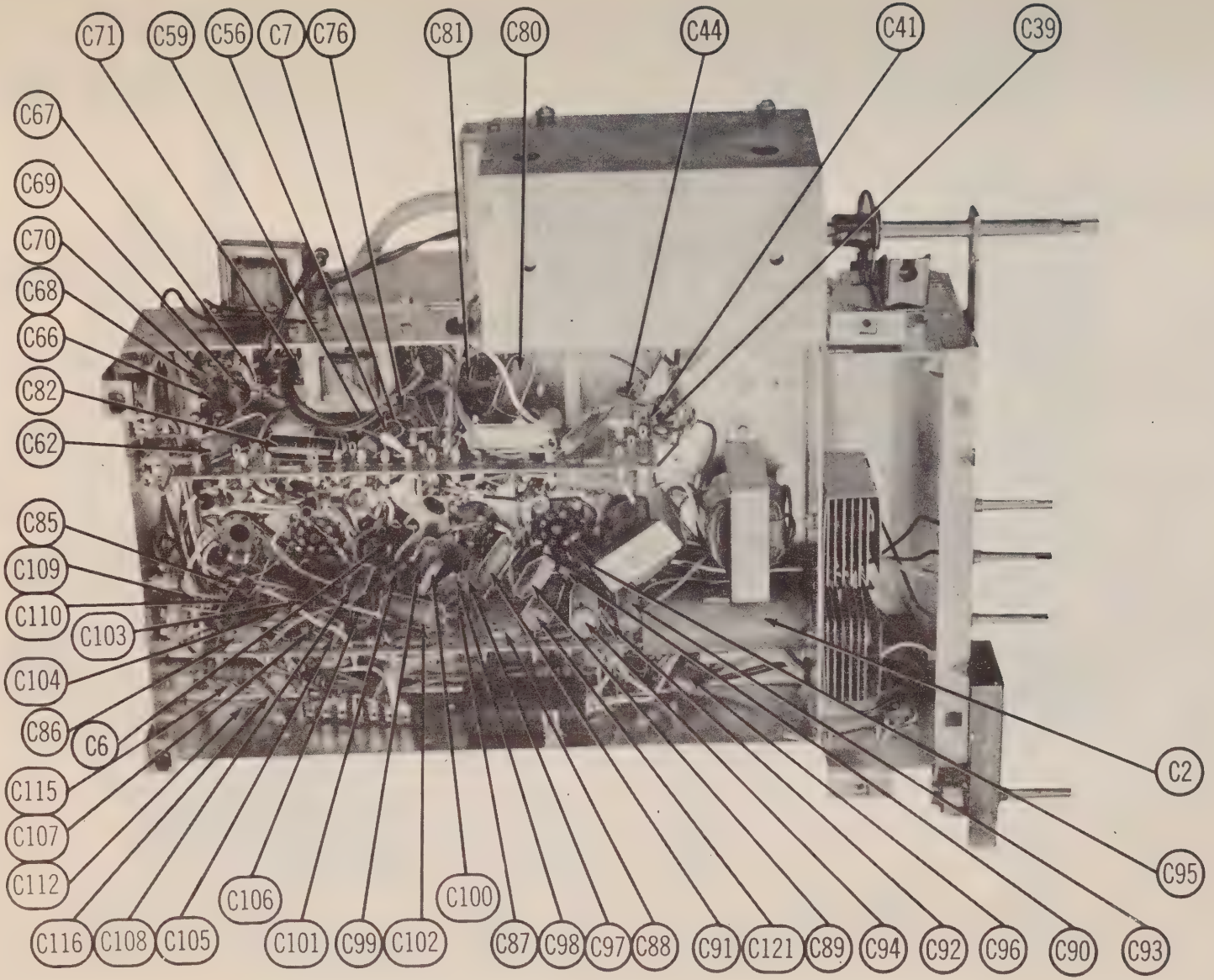
FIG.9

FIG.10

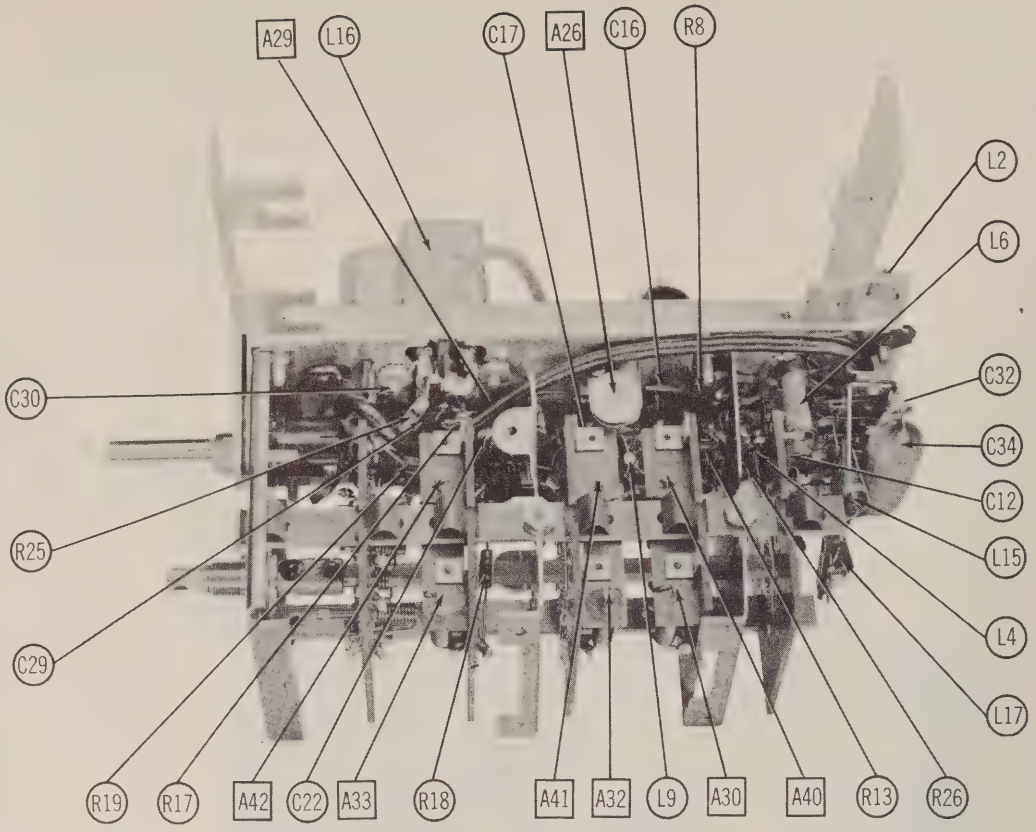
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	†5.6KΩ	0Ω	2.8Ω	0Ω	†57Ω	0Ω	120Ω		
V 2	6AK5	1.2Meg	0Ω	0Ω	3.1Ω	†6.6KΩ	†18KΩ	0Ω		
V 3	12AT7	†5.5KΩ	8.2KΩ	.2Ω	0Ω	0Ω	†6.6KΩ	230KΩ	0Ω	3.1Ω
V 4	6CB6	1.3Meg	100Ω	22Ω	19Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 5	6CB6	1.4Meg	100Ω	19Ω	17Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 6	6CB6	1.2Meg	82Ω	13Ω	16Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 7	12AT7	19KΩ	2.2Meg	0Ω	5.2Ω	5.2Ω	#8.2KΩ	19KΩ	18KΩ	8.5Ω
V 8	6AU6	6Ω	220Ω	9Ω	12Ω	†11KΩ	†40KΩ	220Ω		
V 9	6AU6	56KΩ	1.8Ω	11Ω	8Ω	†2KΩ	80KΩ	1.8Ω		
V 10	6AL5	INF	INF	3.5Ω	8Ω	22KΩ	0Ω	22KΩ		
V 11	6SQ7	33KΩ	4.7Meg	0Ω	0Ω	0Ω	†250KΩ	1.8Ω	5.2Ω	
V 12	25L6GT	INF	29Ω	†1.7KΩ	†48KΩ	500KΩ	0Ω	25Ω	150Ω	
V 13	65L7GT	3.5Meg	†48KΩ	0Ω	2.2Meg	#25KΩ	0Ω	21Ω	19Ω	
V 14	12SN7GT	1Meg	#100KΩ	0Ω	100KΩ	†4Meg	110KΩ	25Ω	23Ω	
V 15	12AU7	#2.7KΩ	2.2Meg	1.2KΩ	23Ω	23Ω	#2.7KΩ	2.2Meg	1.2KΩ	22Ω
V 16	6AL5	1.1Meg	2Meg	21Ω	23Ω	1.1Meg	120KΩ	120KΩ		
V 17	12SN7GT	60KΩ	#50KΩ	45Ω	3.1Meg	†69KΩ	0Ω	25Ω	23Ω	
V 18	25BQ6GT	1Meg	29Ω	INF	†4KΩ	1Meg	INF	25Ω	0Ω	TOP CAP #57Ω
V 19	25W4GT	INF	INF	100KΩ	†150KΩ	†71Ω	†71Ω	11Ω	19Ω	
V 20	1X2	PINS 1 THROUGH 9 HAVE INF RESISTANCE								TOP CAP #435Ω
V 21	17BP4A	1.8Ω	1Meg	PIN 10 #100KΩ	PIN 11 340KΩ	PIN 12 0Ω				

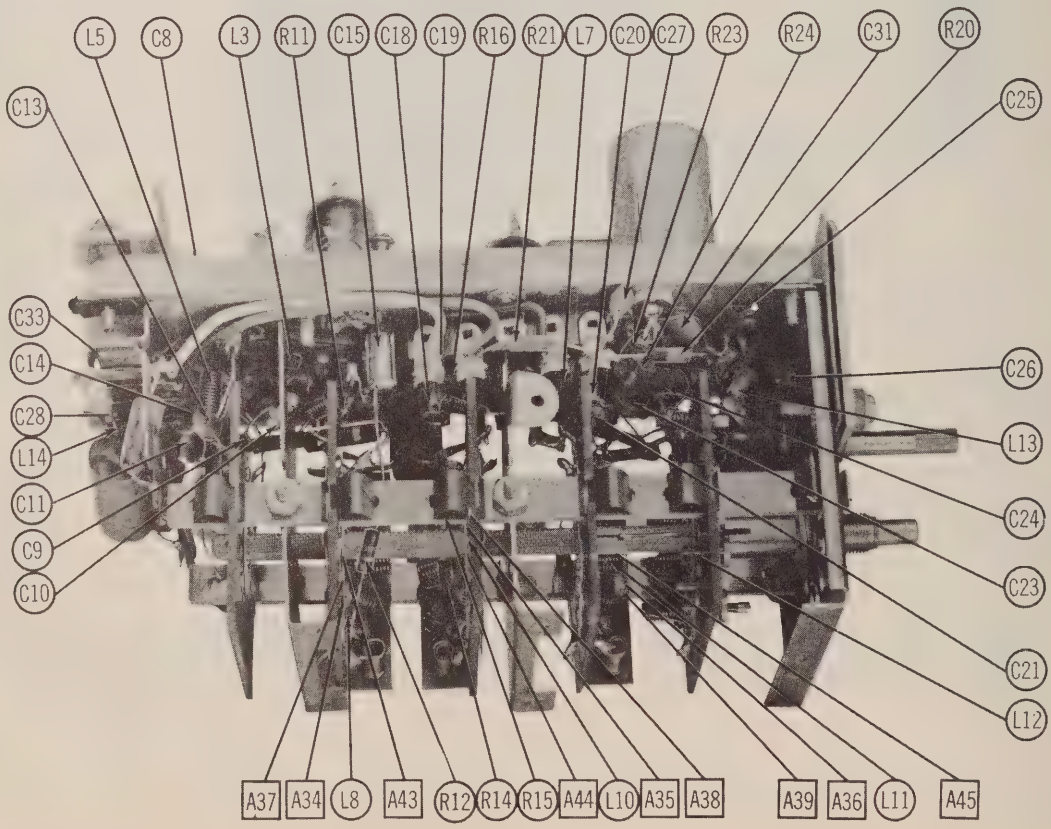
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M2
# MEASURED FROM PIN 3 OF V19



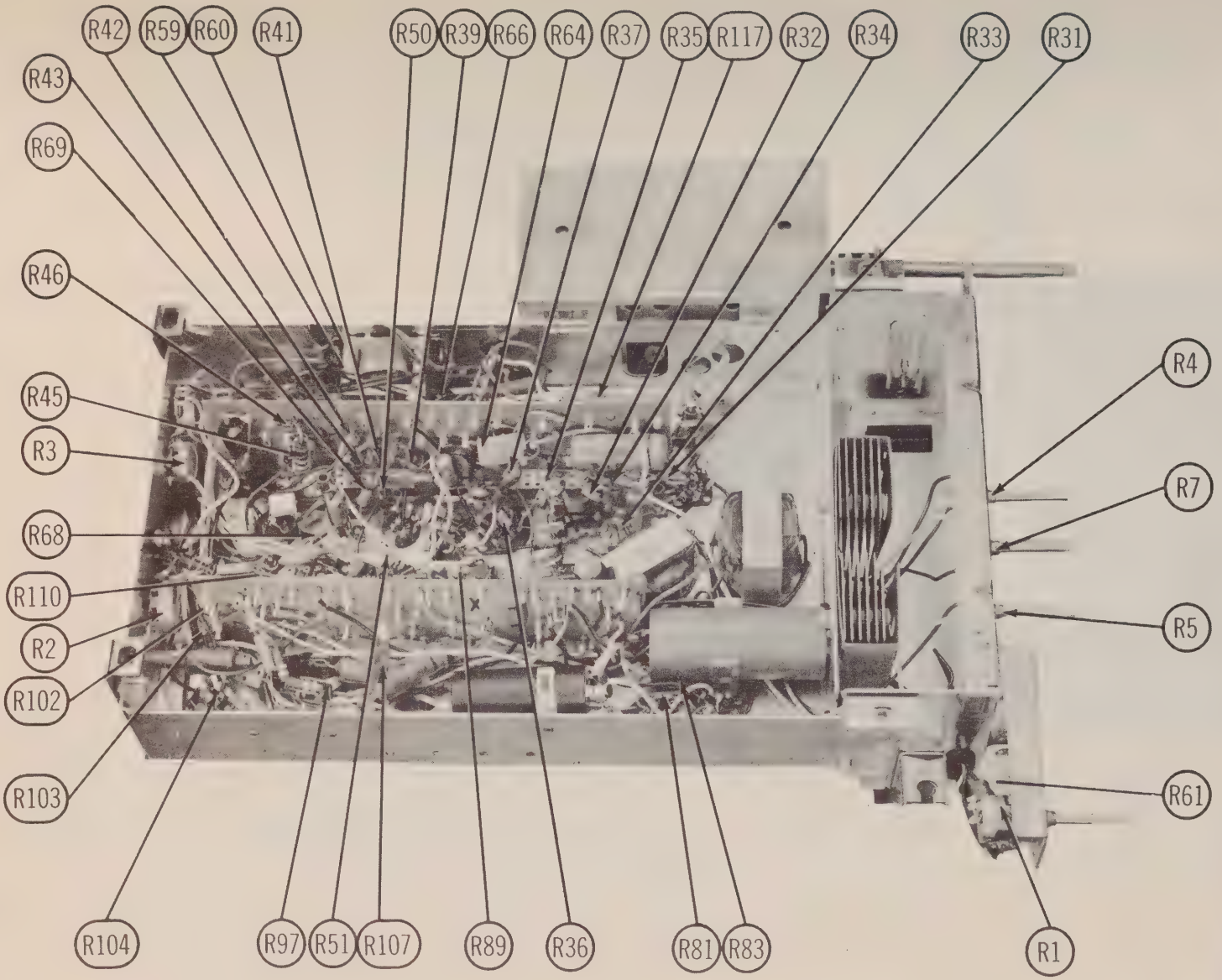
CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



RF TUNER-RIGHT SIDE

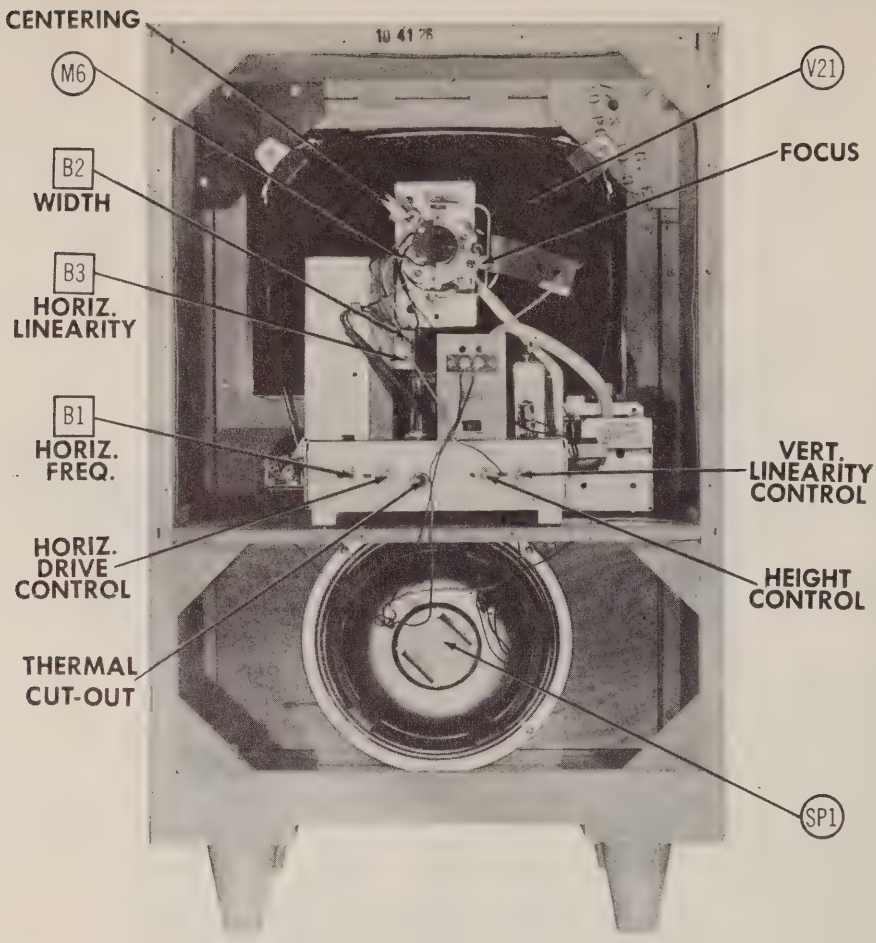


RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLAWN-KNIPP
DENVER, COLORADO



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), to the center of the range over which the picture synchronizes horizontally.

Adjust the horizontal drive control counter-clockwise as far as possible without crowding or beaded vertical lines appearing in the picture.

Adjust the width slug, (B2), until the picture is slightly wider than necessary to fill the mask.

Adjust the horizontal linearity slug, (B3), until the picture is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove 11 wood screws and remove back cover.
3. Disconnect built in antenna and speaker.
4. Remove 4 chassis bolts.
5. Remove 2 nuts from top of picture tube bracket. Remove chassis.
6. Remove 4 nuts holding speaker. Remove Speaker.

Note: For picture tube removal it is necessary to remove chassis as outlined above.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA G.E. PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	1st. RF Amplifier	6AB4	6AB4	5CE	
V2	2nd. RF Amplifier	6AK5	6AK5	7BD	
V3	Converter	12AT7	12AT7	9A	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amplifier				
	Video Output	12AT7	12AT7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Limiter	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6SQ7GT	6SQ7GT	8CK	
V12	Audio Output	25L6GT	25L6GT	7AC	
V13	Sync. Amplifier				
	Sync. Clipper	6SL7GT	6SL7GT	8BD	
V14	Vert. Multi-Vert.				
	Blanking	12SN7	12SN7	8BD	
V15	Vert. Multi-Vert.				
	Output	12AU7	12AU7	9A	
V16	Horiz. Sync. Discr.	6AL5	6AL5	6BT	
V17	Horiz. AFC-Horiz.				
	Oscillator	12SN7GT	12SN7GT	8BD	
V18	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V19	Damper	25W4GT	25W4GT	4CG	
V20	H.V. Rectifier	1X2	1X2	9Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA G.E. PART No.	SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V21	17BP4A	17BP4A		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	300	150	RCE-110	E48A10		UPE30015		TVL-1434	Voltage Doubler
C2	125	350	RCE-111	E48A11		UPE12535		TVL-1638	Filter
C3	80	300	RCE-112	AFH1-35		UP8030		TVL-1573	Filter
C4	30	450	RCE-136	PRS450/30		BR3045A		TVA-1711	Vert. Output Dec.
C5A	100	75	RCE-134	AFH2-93		UPT307		TVL-1714	▲ Vert. Output Cathode
B	20	300						TVA-1420	■ Audio Output Dec.
C6A	10	450	RCE-118	AFH3-179		UPT306		TVL-4826	▲ Decoupling
B	40	300							■ Decoupling
C	10	150							▲ Decoupling
C7	1	50	RCE-090	PRS150/4		BBR1-50T		TVA-1300	Stabilizing Cap.
C8	1		RCN-001		TCZ-1		NP0K-010		Fixed Trimmer
C9	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	1st. RF Amp. Cathode
C10	680		RCW-3045	SI680	D6-681		GP2K-681	5GA-T68	RF Coupling
C11	5		RCW-3057	SI5NP0			NP0K-050		Fixed Trimmer
C12	5	500	UCG-1005	1469-000005		5R5V5		MS-55	Fixed Trimmer
C13	10		RCW-3036	SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C14	10		RCW-3036	SI-10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C15	1-5		RCY-065		829-6				Variable Trimmer
C16A	800		RCN-027	BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	RF Amp. Decoupling
B	800								RF Amp. Fil.
C17	15				TCZ-15		NP0K-150	5TCC-Q15	RF Coupling
C18	1-5		RCY-065		829-6				Variable Trimmer
C19	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	AGC Filter
C20	.6-2.4		RCY-048		829-3				Variable Trimmer
C21	680		RCW-3045	SI680	D6-681		GP2K-681	5GA-T68	2nd. RF Amp. Plate
C22	680		RCW-3045	SI-680	D6-681		GP2K-681	5GA-T68	2nd. RF Amp. Screen
C23	3.9		RCN-028				NP0K-3R9		RF Coupling
V24	1.5		RCW-3046				N750K-1R5		Osc. Coupling
C25	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Osc. Plate Bypass
C26	12		UCG-1006		TCZ-12		NP0K-120		Fixed Trimmer
C27	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Bypass
C28	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Bypass
C29	5	500	UCG-1005	1469-000005		5R5V5		MS-55	Fixed Trimmer
C30	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Mixer Plate Dec.
C31	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Conv. Fil. Bypass
C32	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Bypass
C33	800		RCW-3037	BPD-0008	DD-801	TM5T8	801-001	5HK-D1	AGC Filter
C34	.05	600	UCC-045	P688-05	DF-503	PTE6S5		6TM-S5	RF Bypass *
C35	150	500	UCU-532	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	RF Coupling
C36	150	500	UCU-532	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	RF Coupling
C37	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Tuner Isolation
C38	51	500	UCG-2021						Fixed Trimmer
C39	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C40	.5	200	RCC-016	P288-5		PJ2P5		2TM-P5	AGC Filter
C41	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Decoupling
C42	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Fil. Bypass
C43	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C44	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Line Isolation
C45	5	500	UCG-1005	1469-000005	TCZ-4.7	5R5V5	NP0K-050	MS-55	IF Coupling
C46	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Decoupling
C47	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Fil. Bypass
C48	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Line Isolation
C49	5	500	UCG-1005	1469-000005	TCZ-4.7	5R5V5	NP0K-050	MS-55	IF Coupling
C50	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Decoupling
C51	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Decoupling
C52	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd Video IF Fil. Bypass
C53	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Line Isolation †
C54	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Line Isolation

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No	RATING CAP	RATING VOLT	G.E. PART No	AEROVOX PART No	REPLACEMENT DATA CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C55	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	AGC Filter
C56	.05	200	RCC-105	P288-05	DF-503	P32S5		2TM-S5	Video Coupling
C57	.18	500	UCC-1010	S118	DE-180	SR5Q2	GP1K-180	MS-415	Video Coupling
C58	100	500	UCC-1028	1469-0001		SR5T1		MS-31	Fixed Trimmer
C59	.05	200	UCC-045	P288-05	DF-503	P32S5		2TM-S5	Video Amp. Cathode
C60	6	500	UCC-002	1468-000005		SW5V5		MS-55	Fixed Trimmer
C61	.1	800	RCM-031	P668-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C62	.2	300	UCC-050	P488-22		PTE4P22		4TM-P22	Picture Tube Cathode
C63	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Sound IF Plate Dec.
C64A	6000			BPD-23004	D6-402	TMSD64	822-004	5HK-2D4	Sound IF Screen Bypass †
B	4000				D6-402				Sound IF Cathode Bypass †
C65	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Sound IF Fil. Bypass
C66	100	500	UCU-028	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Limiter Grid Filter
C67	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Limiter Plate Dec.
C68	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Limiter Screen Bypass
C69	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Limiter Cathode Bypass
C70	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Limiter Fil. Bypass
C71	.001	600	UCC-035	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Diode Load Cap.
C72	.002	600	UCC-036	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	De-emphasis
C73	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Audio Coupling
C74	.01	200	UCC-040	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C75	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Plate Current Cont. Isolation
C76	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Audio Coupling
C77	.003	500	UCC-037	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	AF Amp. Plate Bypass
C78A	.01								Audio Coupling
B	250			↑ REK-002					AF Amp. Plate Bypass
C					↑ PC-81				Audio Output Grid
C79	.005	1000	UCC-059	P1068-005		PTE16D5		MB-D5	Audio Output Plate
C80	.1	400	UCC-048	P488-1	DF-104	PTE4P1		4TM-P1	Audio Output Screen
C81	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Audio Output Fil.
C82	.032	1000	RCN-044	P1088-022		PTE16S2		MB-S22	Sync. Coupling
C83	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Line Isolation
C84	470	500	UCU-1044	1469-0005	D6-471	SR5T5	GP2K-471	MS-35	Sync. Coupling
C85	.01	600	RCN-018	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C86	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Sync. Clipper Grid
C87A	.001		★ REK-003	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Vert. Integrator Net.
B	.002			P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Vert. Integrator Net.
C	4700			1469-0005	D6-471	SR5T5	GP2K-471	MS-35	Vert. Sync. Coupling
C88	470	500	UCU-1044	1464-HV-001					Vert. MV Feedback
C89	1000	1000	RCU-390	1464-HV-001					Vert. MV Grid
C90	470	500	UCU-1044	1469-0005	D6-471	SR5T5	GP2K-471	MS-35	Vert. MV Cathode
C91	.1	200	RCC-103	P288-1	DF-104	P12P1		2TM-P1	Vert. Discharge
C92	5000		RCW-3014	BPD-005	DD-502	TMSD5	811-005	5HK-D5	Vert. Discharge
C93	.035	900	RCC-101	P688-025		PTE6S3		6TM-S3	Vert. Sweep Coupling
C94	.1	400	UCC-048	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Feedback
C95	.01	1000	RCN-030	P1088-01		PTE16S1		MB-D1	Fixed Trimmer
C96	1000	1000	RCU-390	1464-HV-001					Horiz. Sync. Coupling
C97	130	800	RCC-299	1469-00015	TCZ-130	SR5T15			Horiz. AFC Filter
C98	100	500	UCU-028	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. AFC Filter
C99	1.08	200	UCC-045	P488-03		PTE4S3		4TM-S3	Horiz. AFC Filter
C100	680	500	RCU-294	S1680	D6-681	SR5T7	GP2K-681	MS-37	Horiz. AFC Filter
C101	.01	600	RCN-025	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. AFC Filter
C102	.05	600	RCC-102	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C103	.0039	600	RCN-034	P688-004	D6-402	PTE6D4	GP2-333-402	6TM-D4	Horiz. AFC Filter
C104	.05	200	RCC-105	P288-05	DF-503	P32S5		2TM-S5	Horiz. AFC Filter
C105	470	500	UCU-1044	1469-0005	D6-471	SR5T5	GP2K-471	MS-35	Horiz. AFC Coupling
C106	.0018	600	RCN-033	S11800	D6-182	PTE6D2	GP2-333-182	6TM-D2	Horiz. Osc. Cap.
C107	220	500	UCG-1036	1469-00025	D6-221	SR5T25	GP2K-221	MS-32	Fixed Trimmer
C108	1000	500	UCU-1052	1464-0001	D6-102	3R5D1	GP2L-102	1FM-21	Fixed Trimmer
C109	.0018	600	RCN-033	S11800	D6-182	PTE6D2	GP2-333-182	6TM-D2	Horiz. Discharge
C110	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Sweep Coupling
C111	6	1500	RCU-300						Horiz. Feedback
C112	22	500	UCG-1012	1469-000025	D6-220	SR5Q25	GP2K-220	MS-42	Horiz. Output Grid
C113	.1	800	UCC-048	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Output Screen
C114	5000		RCW-3014	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Output Cathode *
C115	47	500	UCG-1030	1469-00005	D6-470	SR5Q5	GP2K-470	MS-45	Horiz. Output Fil.
C116	220	500	UCG-036	1469-00025	D6-221	SR5T25	GP2K-221	MS-32	Horiz. Output Fil.
C117	.5	200	RCC-016	P288-5		PJ2P5		2TM-P5	Horiz. Sweep Coupling
C118	18	1500	RCU-293						Horiz. Blanking
C119	.05	800	UCC-045	P688-05	DF-503	PTE6S5		6TM-S5	Decoupling
C120	.1	600	RCC-104	P688-1		PTE6P1		6TM-P1	Damper Filter
C121	.05	600	RCC-102	P688-05		PTE6S5		6TM-S5	Damper Filter ¶
C122	180	3000	RCU-304						Fixed Trimmer
C123	500	20000	RCN-035	HV20C	TV3-502	MM-C20T5			HV Filter
C124	22	500	UCG-1012		TCZ-22	SR5Q2	NP0K-220	MS-42	Fixed Trimmer

† Items C78A, C78B, C78C, R64A, R64B, are combined in one unit
When replacing items separately, C78B and C78C should total 250MMF
★ Items C87A, C87B, R75A, R75B are combined in one unit
† Some Models use 5000MMF in this application (Part No. RCW-3014)
¶ Some Models use .1MFD in this application (Part No. RCC-104)

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA G.E. PART No	IRC PART No	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
				Concentrikit			
R1A	2Meg	½	RRC-176	B11-139 *		SBBT-702-8	Contrast Control - Panel
B	500KΩ	½		B1B-123X *			Volume Control - Tapped @ 280KΩ Rear
C	Shaft						
	end		Not Req.	E202 *		Not Req.	Attach per instructions in Concentrikit
D	Switch		Not Req.	↑ *		Not Req.	Attach per instructions in Concentrikit
R2A	25KΩ	½	RRC-140	Q11-120	AG-40-S	AN-26	Horiz. Drive Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	Meg	½	RRC-096	Q1-140	AG-85-S	AN-86	Height Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R3A per instructions
R4A	100KΩ	½	RRC-173	Q11-128	AG-49-S	AN-40	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R4A per instructions
R5A	500KΩ	½	RRC-175	Q11-133	AG-58-S	AN-59	Brightness Control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R5A per instructions
R6A	4000Ω	½	RRC-127	Q11-114	AM-80-S	AN-30	Vert. Linearity Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	125KΩ	½	RRC-174		AM-49-S		Vert. Hold Control
B	Shaft		Not Req.		RS-2		Attach to R7A per instructions

* Additional Parts to be used with "Concentrikit"

RESISTORS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA G.E. PART No.	IRC PART No	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R8	120Ω	½	URD-027	BTS-120	1st. RF Amp. Cathode
R9	3.3Meg	½	URD-033	BTS-3.3Meg	Antenna Isolation
R10	3.3Meg	½	URD-033	BTS-3.3Meg	Antenna Isolation
R11	18KΩ	½	URD-079	BTS-18K	1st. RF Amp. Plate
R12	18KΩ	½	URD-019		1st. RF Coil Shunt
R13	5600Ω	1	URE-067		1st. RF Amp. Decoupling
R14	680Ω	½	URD-045	BTS-680	2nd. RF Grid Coil Shunt
R15	1200Ω	½	URD-051	BTS-1200	2nd. RF Grid Coil Shunt
R16	10KΩ	½	URD-073	BTS-10K	2nd. RF Amp. Grid
R17	12KΩ	½			2nd. RF Amp. Screen
R18	5600Ω	½	URD 087		2nd. RF Coil Shunt
R19	1000Ω 20%	½	URD-049	BTS-1000	2nd. RF Amp. Decoupling
R20	3300Ω 20%	½	URD 061	BTS-3300	Osc. Plate
R21	2200Ω 20%	½	URD-057	BTS-2200	Osc. Plate Decoupling
R22	8200Ω	½	URD-071	BTS-8200	Osc. Grid
R23	10KΩ	½	URD-073		Mixer Grid
R24	220KΩ 20%	½	URD 105	BTS-220K	Mixer Grid
R25	1000Ω 20%	½	URD-049	BTS-1000	Mixer Plate Decoupling
R26	1000Ω	½	URD-049	BTS 1000	Mixer Plate Coil Shunt
R27	22KΩ	½	URD-081	BTS-22K	1st. Video IF Coil Shunt
R28	100Ω	½		BTS-100	1st. Video IF Amp. Cathode
R29	100KΩ 20%	½	URD-097	BTS-100K	AGC Network
R30	27KΩ	½	URD-083	BTS-27K	2nd. Video IF Coil Shunt - See Note 1
R31	1000Ω 20%	½	URD-049	BTS-1000	1st. Video IF Amp. Decoupling
R32	220KΩ	½	URD-105	BTS-220K	2nd. Video IF Amp. Grid
R33	100Ω	½		BTS-100	2nd. Video IF Amp. Cathode
R34	1000Ω 20%	½	URD-049	BTS-1000	2nd. Video IF Amp. Decoupling
R35	68KΩ	½	URD-093	BTS-68K	3rd. Video IF Amp. Grid
R36	82Ω	½	URD-023	BTS-82	3rd. Video IF Amp. Cathode
R37	1000Ω 20%	½	URD-049	BTS-1000	3rd. Video IF Amp. Decoupling
R38	2200Ω	10	URW-080	1 3/4A-2250	Peaking Coil - Wire Wound
R39	3600Ω 5%	½	URD-1062	BTS-3600 5%	Video Det. Diode Load
R40	22KΩ	½	URD-081	BTS-22K	AGC Network
R41	2.2Meg	½	URD-129	BTS-2.2Meg	Video Amp. Grid
R42	1500Ω	½	URD-053	BTS-1500	Video Amp. Plate
R43	68KΩ	2	URS-078	BTS-18K	Voltage Divider
R44	1Meg	½	URD-121	BTS-1Meg	Voltage Divider
R45	4700Ω	2	URF-065	BTB-4700	Video Amp. Plate
R46	220Ω	½	URD-033	BTS-220	Video Amp. Plate
R47	1Meg 20%	½	URD-121	BTS-1Meg	Picture Tube Grid
					Picture Tube Cathode
R48	220KΩ	½	URD-105	BTS-220K	Voltage Divider
R49	100KΩ 5%	½	URD-1097	BTS-100K 5%	Voltage Divider
R50	220Ω	½	URD-033	BTS-220	Sound IF Amp. Cathode
R51	39KΩ	½	URD-087	BTS-39K	Sound IF Amp. Screen
R52	10KΩ	½	URD 073	BTS-10K	Sound IF Amp. Plate Decoupling
R53	56KΩ	½	URD-091	BTS-5K	AVC Network
R54	100KΩ 5%	½	URD-1097	BTS-10.K 5%	Voltage Divider
R55	470KΩ	½	URD-113	BTS-470K	Limiter Screen
R56	1000Ω 20%	½	URD-049	BTS-1000	Limiter Plate Decoupling
R57	270Ω	½	URD-035	BTS-270	Balancer
R58	22KΩ 5%	½	URD-1081	BTS-22K 5%	Ratio Det Diode Load
R59	22KΩ 5%	½	URD-1081	BTS-22K 5%	Ratio Det Diode Load
R60	22KΩ	½	URD-081	BTS-22K	De-emphasis
R61	68KΩ	½	URD-093	BTS-68K	Tone Compensation
R62	4.7Meg	½	URD-137	BTS-4.7Meg	AF Amp. Grid
R63	33KΩ	½	URD-085	BTS-33K	Isolation
R64A	250KΩ	½	REK-002†		AF Amp. Plate
B	500KΩ	½			Output Grid
R65	1000Ω 20%	½	URD-049		Parasitic Suppressor
R66	150Ω	½	URD-029	BTS-150	Output Cathode
R67	47KΩ	½	URD-089	BTS-47K	Output Screen
R68	2.2Meg	½	URD-129	BTS-2.2Meg	Sync. Amp. Grid
R69	470KΩ	½	URD-113	BTS-470K	Isolation
R70	22KΩ	½	URE-081	BTA-22K	Sync. Amp. Plate
R71	470KΩ	½	URD-113	BTS-470K	Isolation
R72	47KΩ	½	URD-089	BTS-47K	Sync. Clipper Plate
R73	470KΩ 20%	½	URD-113	BTS-470K	AGC Network
R74	1.5Meg 20%	½	URD-125	BTS-1.5Meg	Sync. Clipper Grid
R75A	39KΩ	½	REK-003 ★	BTS-39K	Integrator Network
B	82KΩ	½		BTS-82K	Integrator Network ,
R76	1Meg	½	URD-121	BTS-1Meg	Vert. Blanking Grid
R77	100KΩ 5%	½	URD-1097	BTS-100K 5%	Vert. MV Grid
R78	68KΩ	½	URD-093	BTS-68K	Vert. MV Cathode
R79	2.2Meg	½	URD-129	BTS-2.2Meg	Vert. MV Plate
R80	4700Ω	½	URD-065	BTS-4700	Vert. Peaking
R81	100KΩ 5%	½	URD-1097	BTS-100K 5%	Vert. Feedback
R82	47KΩ	½	URD-089	BTS-47K	Vert. Feedback
R83	2.2Meg	½	URD 129	BTS-2.2Meg	Vert. Output Grid
R84	8200Ω 5%	½	URE-1047	BTA-820	Vert. Output Cathode
R85	1500Ω 20%	1	URE-053	BTA-1500	Vert. Output Decoupling
R86	150KΩ	1	URE-101	BTA-150K	Voltage Divider
R87	150KΩ	1	URE-101	BTA-150K	Voltage Divider
R88	150KΩ	1	URE-101	BTA-150K	Voltage Divider
R89	180KΩ	½	URD-103	BTS-180K	Horiz. Sync. Discr. Diode Load
R90	1Meg	½	URD-121	BTS-1Meg	Horiz. Sync. Discr. Diode Load
R91	1Meg	½	URD-121	BTS-1Meg	Horiz. Sync. Discr. Diode Load
R92	150KΩ	½	URD-101	BTS-150K	Horiz. AFC Filter
R93	1Meg	½	URD-121	BTS-1Meg	Horiz. AFC Filter
R94	33KΩ	½	URD-085	BTS-33K	Horiz. AFC Filter
R95	68KΩ	1	URE-093	BTA-68K	Horiz. AFC Plate
R96	150KΩ	1	URE-101	BTA-150K	Horiz. Feedback
R97	150KΩ	1	URE-101	BTA-150K	Horiz. Feedback
R98	27KΩ	½	URD-063	BTS-27K	Horiz. Peaking
R99	68KΩ	½	URD-093	BTS-68K	Horiz. Osc. Grid
R100	33KΩ	1	URE-085	BTA-33K	Horiz. Osc. Plate
R101	10KΩ	½	URD-073	BTS-10K	Horiz. Peaking
R102	1Meg	½	URD-121	BTS-1Meg	Horiz. Output Grid
R103	15KΩ	½	URD-077	BTS-15K	Voltage Divider
R104	33Ω	½	URD-037		Parasitic Suppressor
R105	39Ω	1	RRW-077	BW-1-39	Horiz. Output Cathode - Wire Wound See Note 2
R106	4000Ω	7	RRW-053	1 3/4A-4000	Horiz. Output Screen - Wire Wound
R107	↑	↑	RRW-088		Voltage Divider
R108	1.3Ω	½	RRW-058		HV Rectifier Filament - Wire Wound
R109	470KΩ	1	URE-113		HV Filter
R110	3300Ω	1	URE-061	BTA-3300	Decoupling
R111	1200Ω	1	URD-051	BTS-1200	Centering Network

RESISTORS (CONT.)

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA G.E. PART No.	IRC PART No.	IDENTIFICATION CODES
R112	180KΩ	1	URD-103	BTS-180K	Horiz. Feedback
R113	1000Ω	1	URE 049	BTA 1000	Decoupling
R114	1500Ω	5	RRW-082	1 3/4A-1500	Filter - Wire Wound
R115	4.8Ω	5	RRW-048		Surge Limiter - Wire Wound
R116	↑	↑	RRW-054		Filament Dropping - Temperature Compensating
R117	20Ω	5	RRW-081	1 3/4A-20	Filament Dropping - Wire Wound
R118	5600Ω	5	RRW-079	1 3/4A-6000	Decoupling - Wire Wound

Note 1. Some Models use a 33KΩ Resistor in this application
Note 2. Not used in all Models
† Special Resistor which measures 14KΩ at 140 Volts
† Items R64A, R64B, C78A, C78B, C78C are combined in one unit
★ Items R75A, R75B, C87A, C87B are combined in one unit
‡ Resistance varies with temperature (Ohms Hot, 275 Ohms Cold)

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI	RATING SEC 1	RATING SEC 2	RATING SEC. 3	REPLACEMENT DATA G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .03A	6.3VAC @ 6A			RTF-002	P-8134	P-2944	F-633

TRANSFORMER (SWEEP CIRCUITS)

ITEM No	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC	REPLACEMENT DATA G. E. PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No.	NOTES
T2	420Ω Tapped @ 42Ω	18Ω @ 12Ω SEC. 2 9Ω	RTO-114	A-8130	HV0-7		Horiz. Output Trans.
T3	1KΩ	7.5Ω	RTO-064	A-8112 ① ②	A-3038 ②	TS0-5 ②	Vert. Output Trans.
T4A	30Ω		RLD-040				Hor. Deflection Coils
B	52Ω						Vert. Deflection Coils

① Drill One New Mounting Hole
② Add Shield if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI	RATING IMPEDANCE SEC	RATING DC RES. PRI	RATING DC RES. SEC.	REPLACEMENT DATA G.E. PART No.	STANCOR PART No.	MERIT PART No	CHICAGO PART No.	INSTALLATION NOTES
T5	2.8KΩ	3.8Ω	200Ω	.4Ω	RTO-082 ③ RTO-032 ④ RTO-081 ⑤	A-3849	A-3018	RO-307	③ Used in Models 17C113 & 17C117 ④ Alternate Trans. for Models 17C113 & 17C117 ⑤ Used in Model 17T7

SPEAKER

ITEM No	RATINGS FIELD RES.	RATINGS V. C. IMP	RATINGS CONE DIA.	RATINGS V. C. DIA.	REPLACEMENT DATA G.E. PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	P.M.	3.8Ω			SI21D2 ③ SI21D3 ④ S527D ④	12J12	12A4A	③ Used in Models 17C113, 17C115, 17C117, 17C120 ④ Used in Model 17T7
SP1B	12"	1						

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA G. E. PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	INSTALLATION NOTES
L1	260ADC	57Ω	1 Henry	RTL-096	C-2326 ①	C-2996 ①	IR-3300 ①	① Drill One New Mounting Hole

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA G. E. PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Trans.	0Ω	0Ω	RLA-037			
L3	Ant. Coil	0Ω		RLI-165			
L4	Ant. Coil	0Ω					
L5	RF Choke	0Ω					
L6	IF Trap	0Ω		RLI-159			
L7	Fil. Choke	.31Ω		RLI-144		CLA	.56 Microhenries
L8	1st. RF Plate Coils	0Ω					
L9	RF Coil	0Ω					
L10	2nd. RF Grid Coils	0Ω					
L11	2nd. RF Plate Coils	0Ω					
L12	Osc. Coils	0Ω					
L13	Cath. Choke	.1Ω		RLI-136			
L14	RF Choke	13.4Ω					
L15	RF Choke	3Ω		RLI-154		CLA	3.3 Microhenries
L16	Conv. Plate	0Ω	0Ω	RTL-126			
L17	RF Choke	3Ω		RLI-154		CLA	3.3 Microhenries
L18	1st. Video IF	.1Ω	.1Ω	RTL-127			Includes 47.25MC Trap
L19	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L20	2nd. Video IF	.1Ω		RLI-096			

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) (CONT.)

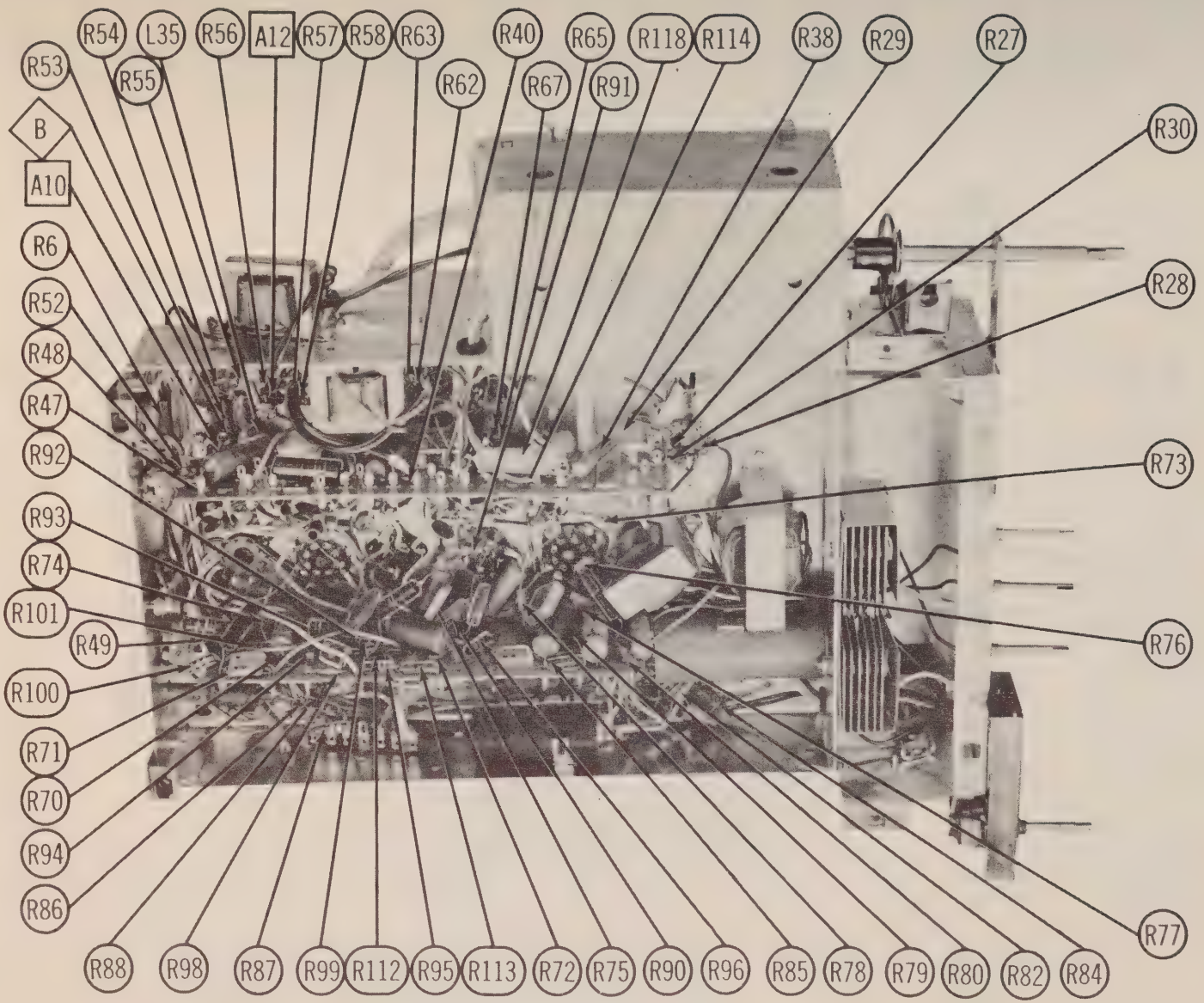
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	G. E. PART No.	MERIT PART No.	IRC PART No.	
L21	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L22	3rd. Video IF	.1Ω		RLI-110			Includes 47.25MC Adj. Channel Trap
L23	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L24	RF Choke			RLF-024			Not Used In All Models
L25	Peaking Coil	5.8Ω		RLI-162			165 Microhenries
L26	RF Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L27	Peaking Coil	6.6Ω		RLI-093			165 Microhenries, Wound on 6.8KΩ Resistor
L28	4.5MC Trap	.4Ω		RLI-100			
L29	Peaking Coil	4.5Ω		RLI-108			110 Microhenries
L30	Peaking Coil	6.6Ω		RLI-161			165 Microhenries, Wound on 6.8KΩ Resistor
L31	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L32	Peaking Coil	5.8Ω		RLI-162			165 Microhenries
L33	Peaking Coil	5Ω		RLI-109			130 Microhenries
L34	Sound IF	3Ω	3Ω	RLI-097			
L35	RF Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L36	Ratio Det. Trans.	3.5Ω	.6Ω	RTD-008			Tap ⓐ .6Ω
L37	Fil. Choke	1.8Ω		RLI-122		CLA	2.2 Microhenries
L38	Horiz. Osc.	100Ω		RLC-091			Tap ⓐ 55Ω
L39	Width Coil	27.5Ω		RLD-014	MWC-1		
L40	Horiz. Lin.	15.5Ω		RLD-016			

SELENIUM RECTIFIER

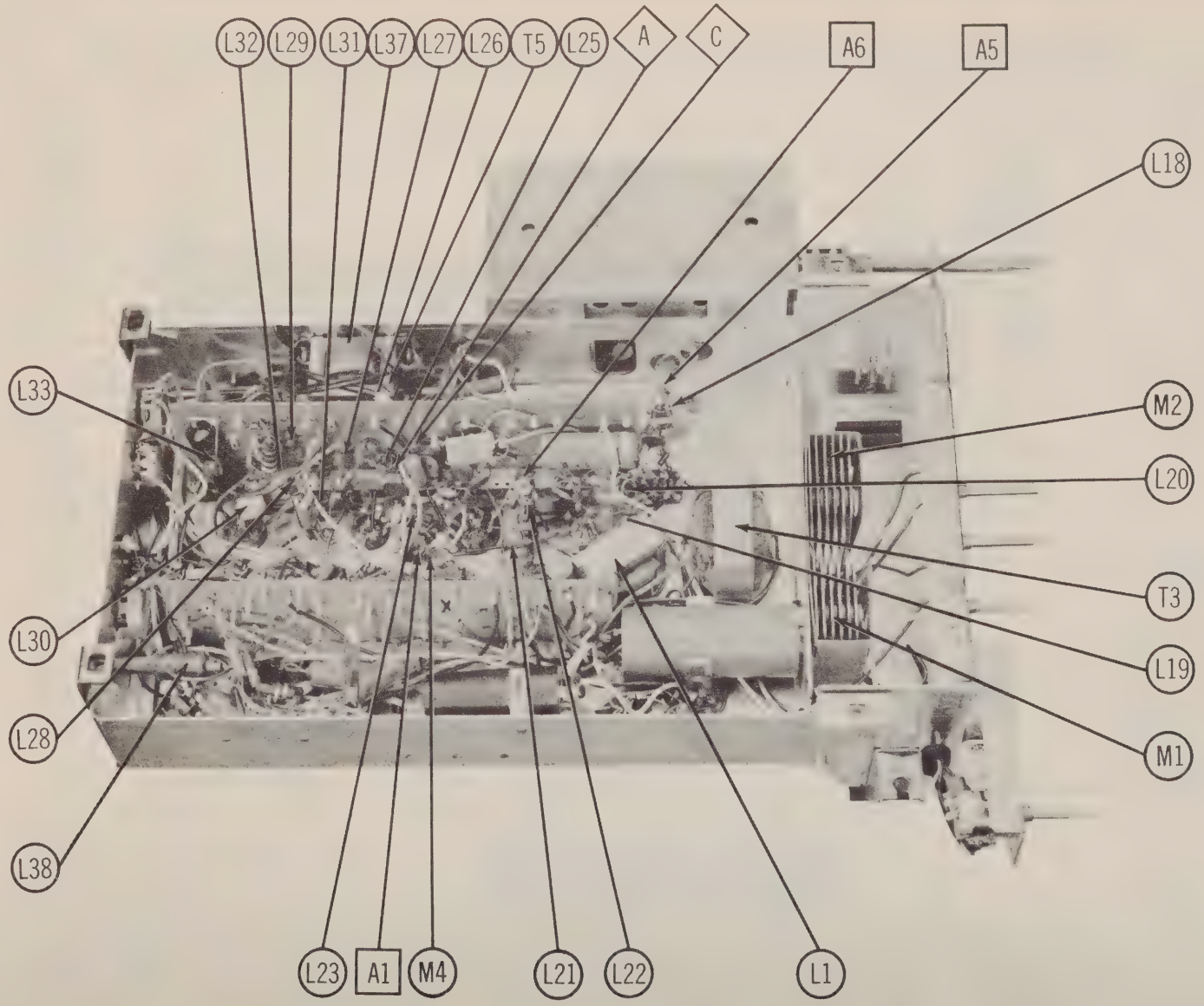
ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT	G. E. PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	
M1	.260A.	RER-008	NJ-5	6S2	1022	
M2	.260A.	RER-008	NJ-5	6S2	1022	

MISCELLANEOUS

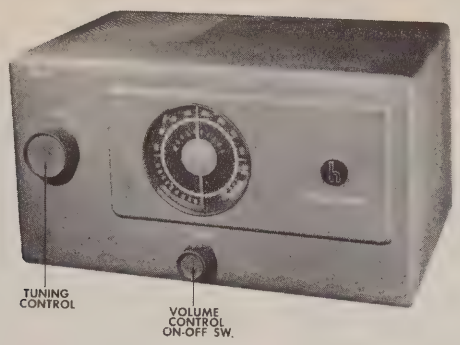
ITEM No.	PART NAME G. E.	PART No.	NOTES
M3	RF Tuner		
	IF Coil		
	Capacitor	RCN-029	9MMF 500V
M4	Crystal	1N64	1N64 — Video Det. Assembly Complete Part # RLX-029
	Capacitor	UCG-1005	5MMF
	RF Choke	RLF-024	31 Microhenries
M5	Focus Magnet	RLF-049	
M6	Ion Trap	RET-003	
M7	Thermal Cutout	RSR-002	
	Switchwafer	RSX-023	Ant. with Coils
	Switchwafer	RSX-022	1st. RF Plate with Coils
	Switchwafer	RSX-021	2nd. RF Grid with Coils
	Switchwafer	RSX-020	2nd. RF Plate with Coils
	Switchwafer	RSX-019	Osc. with Coils
	Escutcheon	RDE-125	Knob
	Knob	RDK-244	Horiz. Hold, Vert. Hold, Brightness
	Knob	RDK-264	Channel Selector
	Knob	RDK-261	Fine Tuning
	Knob	RDK-262	Contrast
	Knob	RDK-263	Off/On Volume
	Knob	RDK-275	Tuning Models 17T7, 17C117, 17C120
	Knob	RDK-276	Contrast Models 17T7, 17C117, 17C120



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW- INDUCTOR AND ALIGNMENT IDENTIFICATION



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DENVER, COLORADO

HALLICRAFTERS
MODEL S-81

TRADE NAME	Hallicrafters Model S-81
MANUFACTURER	Hallicrafters Corp., 4401 W. 5th Ave., Chicago, 24, Ill.
TYPE SET	AC/DC Operated FM Superheterodyne Receiver
TUBES (SIX)	Types 12AT7 Conv., 12BA6 1st. IF Amp., 12BA6 2nd. IF Amp., 12AL5 Ratio Det., 12SQ7 AF Amp., 50L6GT Audio Output.
POWER SUPPLY	110-120 Volts AC/DC RATING .3 Amp. @ 117 Volts AC
TUNING RANGE-FREQ. MOD.	152-173MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B- .

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Point Ⓐ. The junction of these two resistors is alignment Point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to Pin 1, (grid) of 12BA6, (V2). Low side to B- .	10.7MC (Unmod.)	Tuning gang fully closed	DC probe to Point Ⓐ. Common to B -.	A1, A2 A3	Adjust for max. deflection.
2.	"	High side to Pin 7, (Grid) of 12AT7 (V1). Low side to B- .	"	"	"	A4, A5	"
3.	"	"	"	"	DC probe to Point Ⓑ. Common to Point Ⓒ.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to Pin 1, (grid), of 12BA6, (V2). Low side to B- .	10.7MC (450KC swp)	Point of non-interference.	Vert. amp. to Point Ⓐ. Low side to B- .	A1, A2 A3	Disconnect stabilizor capacitor C2. Adjust for max. amplitude & symmetry as per Fig. 1.
2.	"	High side to Pin 7 (grid) of 12AT7, (V1) Low side to B- .	"	"	"	A4, A5	"
3.	"	"	"	"	Vert. amp. to Point Ⓑ. Low side to B- .	A6	Reconnect capacitor C2. Adjust A6 so 10.7MC occurs at center of cross-over lines as per Fig. 2. SLIGHTLY retouch A1 for maximum amplitude & straightness of crossover lines.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	68Ω carbon resistor	High side thru 68Ω to ant. term. "A1". Low side to "A2".	170MC	170MC	DC probe to Point Ⓐ. Common to B -.	A7, A8	Adjust for max. deflection. Rock tuning gang while adjusting A8.
5.	"	"	152MC	152MC	"	L2, L1	Check low end tracking. If necessary expand or compress coils for max. deflection. If coils are changed repeat steps 4 & 5 until no further improvement can be made.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT		
V1	Converter	90X12AT7	12AT7	9A	
V2	1st. IF Amplifier	90X12BA6	12BA6	7BK	
V3	2nd. IF Amplifier	90X12BA6	12BA6	7BK	
V4	Ratio Detector	90X12AL5	12AL5	6BT	
V5	AF Amplifier	90X12SQ7	12SQ7	8Q	
V6	Audio Output	90X50L6GT	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

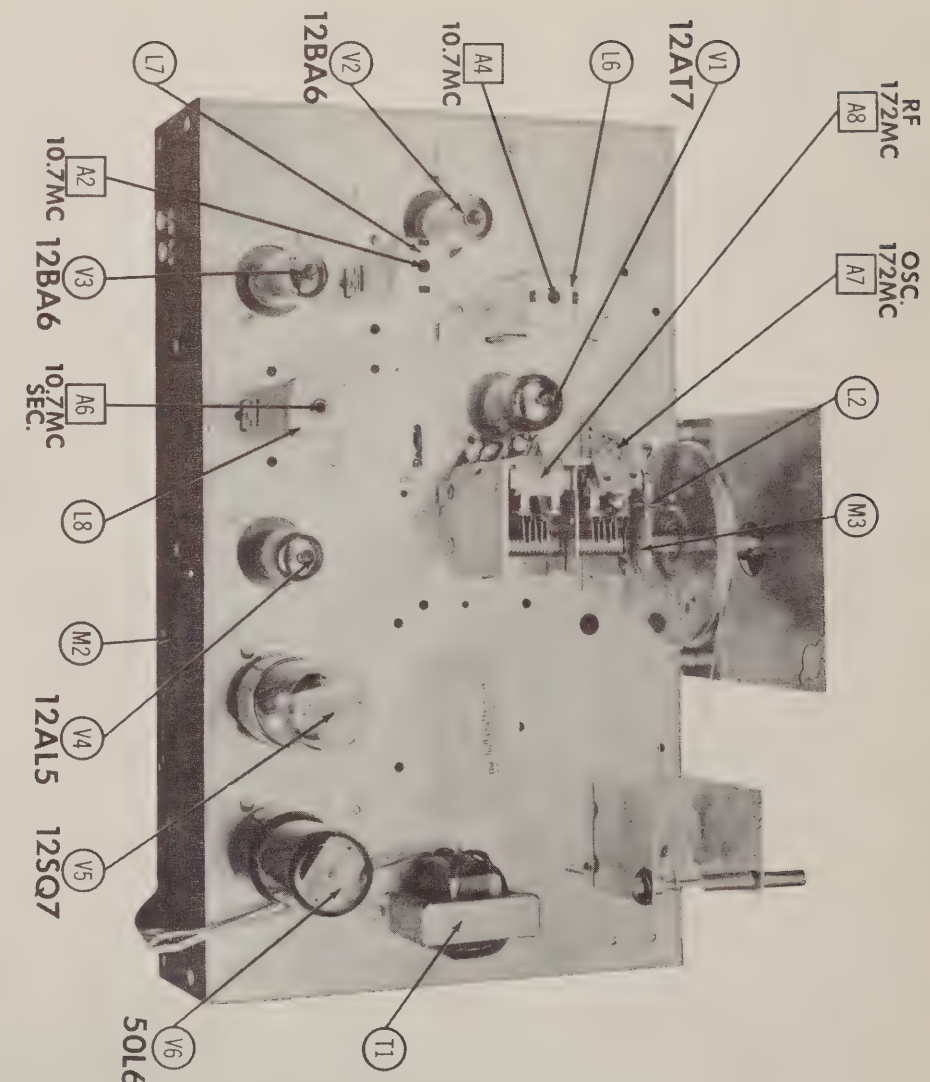
ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	60	150	45B091	PRS1010D4A		EZ55515C		TVA-3436	Filter (Red)
B	40	150		PRS150/40				TVA-1413	Filter (Yellow)
C	40	150							Decoupling (Yellow)
D	20	25							Output Cathode (Blue)
C2	2	50	45B192	PRS150/4		BBR2-50		TVA-1301	Stabilizing Cap.
C3	330		47B20331K5	SI330	D6-331		GP2K-331	5GA-T33	Ant. Isolation
C4	330		47B20331K5	SI330	D6-331		GP2K-331	5GA-T33	RF Coupling
C5	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling †
C6	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling *
C7	39				TCN-39		N750K-390		Osc. Grid Cap. ¶
C8	5000		47A168	BRD-005	DD-502	TM5D5	811-005	5HK-D5	Osc. Plate Bypass
C9	10000		47A224	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Mixer Cathode Bypass
C10	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Conv. Fil. Bypass
C11	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Conv. Fil. Bypass
C12	33		47X25C330J	SI33NP0	TCZ-33		NP0K-330	5TCC-Q33	Fixed Trimmer
C13	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Mixer Plate Dec.
C14	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. IF Amp. Dec.
C15	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. IF Amp. Cathode
C16	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. IF Amp. Dec.
C17	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. IF Amp. Cathode
C18	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. IF Amp. Fil.
C19	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Ratio Det. Fil.
C20	100		47X25UK101K	SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Diode Load Cap.
C21	100		47X25UK101K	SI-100NP0	TCZ-100		NP0-333-101	5TCC-T1	Diode Load Cap.
C22	1000		47B20102M5	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	De-emphasis
C23	.01	600	46AY103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C24	.01	600	46AY103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C25	.005	600	46AY502J	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C26	.05	600	46AY503J	P688-05		PTE6D5		6TM-D5	Line Isolation

* Not used in all models.
† Some models use .68 MMF in this application (Part No. 47A160-1).
¶ Some models use 47 MMF in this application (Part No. 47X20UK470K).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST-ANCE	WATTS	Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO:	
R1A	2Meg	½	25B896	Q13-139	AG-66-Z	B-76-S	Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Hallicrafters PART No.	IRC PART No.	
R2	1000Ω	1/2	23X20X102K	BTS-1000	Mixer Cathode
R3	1000Ω	1/2	23X20X102K	BTS-1000	Mixer Plate Decoupling
R4	1000Ω	1/2	23X20X102K	BTS-1000	Osc. Plate Decoupling
R5	10KΩ	1/2	23X20X103K		Osc. Grid
R6	100Ω	1/2	23X20X101K	BTS-100	1st. IF Amp. Cathode
R7	1000Ω	1/2	23X20X102K	BTS-1000	1st. IF Amp. Decoupling
R8	100Ω	1/2	23X20X101K	BTS-100	2nd. IF Amp. Cathode
R9	1000Ω	1/2	23X20X102K	BTS-1000	2nd. IF Amp. Decoupling
R10	47KΩ	1/2	23X20X473K	BTS-47K	Ratio Det. Diode Load
R11	47KΩ	1/2	23X20X473K	BTS-47K	Diode Filter
R12	2.2Meg	1/2	23X20X225K	BTS-2.2Meg	AF Amp. Grid
R13	270KΩ	1/2	23X20X274K	BTS-270K	AF Amp. Plate
R14	470KΩ	1/2	23X20X474K	BTS-470K	Output Grid
R15	150Ω	1/2	23X20X151K	BTS-150	Output Cathode
R16	100Ω	1/2	23X20X101K	BTS-100	Output Transformer Shunt
R17	22Ω	1/2	23X20X220K		Surge Limiter
R18	220Ω	1	23X30X221K	BTA-220	Filter
R19	470Ω	1	23X30X471K	BTA-470	Filter
R20	100Ω	1		BTA-100	Filament Dropping - See Note 1
R21	100Ω	1		BTA-100	Filament Dropping - See Note 2
R22	270Ω	1	24BW271E	BTA-270	Filament Shunt

Note 1. Some Models use a 47Ω Resistor in this application
Note 2. Not used in all Models

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1.7KΩ	3.0Ω	145Ω	.8Ω	55A127	A-3876	A-2928	RO-2	

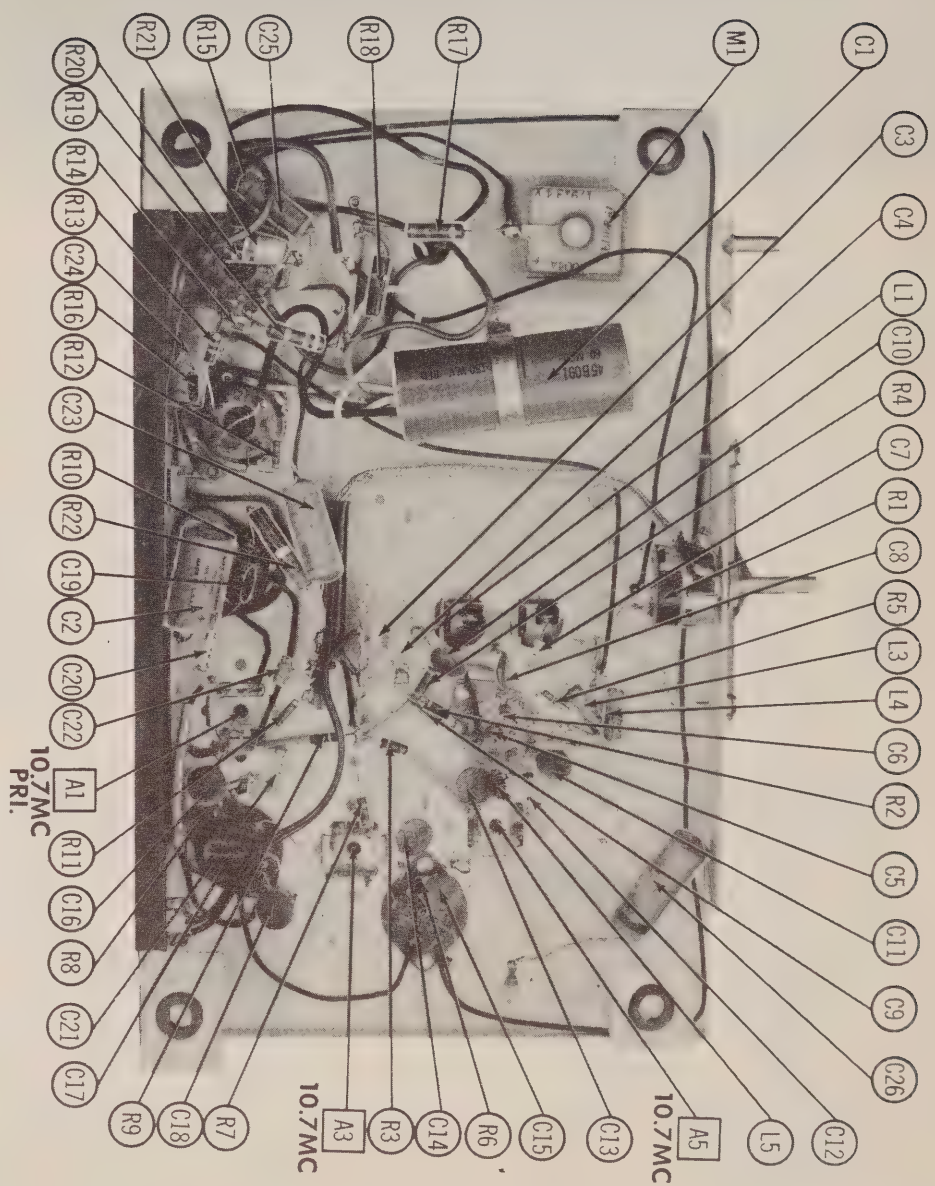
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Hallicrafters PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.0Ω	85C120	ST-105 Mod. P5-X	5A1	
	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Hallicrafters PART No.	MERIT PART No.	IRC PART No.	
L1	Ant. Coil	0Ω		51A1472			
L2	Osc. Coil	0Ω		51A1471			
L3	Cath. Choke	1.8Ω		53A238		CLA	2.2 Microhenries
L4	Fil. Choke	3Ω		53A239		CLA	3.3 Microhenries
L5	Parasitic Suppressor	0Ω		53A239			Wound on 4.7KΩ Resistor
L6	Input IF	.8Ω	.8Ω	50C519			
L7	Output IF	.8Ω	.8Ω	50C517			
L8A	Ratio Det. Trans.	3.8Ω	.2Ω	50-518			Tap ⓐ .9Ω
B	Ratio Det. Trans.			50C518			Alternate

CHASSIS—BOTTOM VIEW



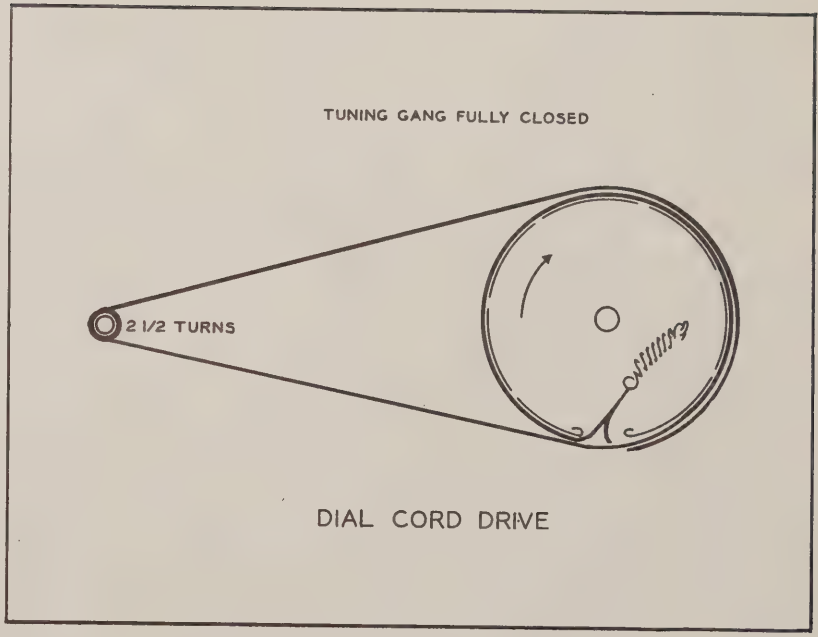
PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

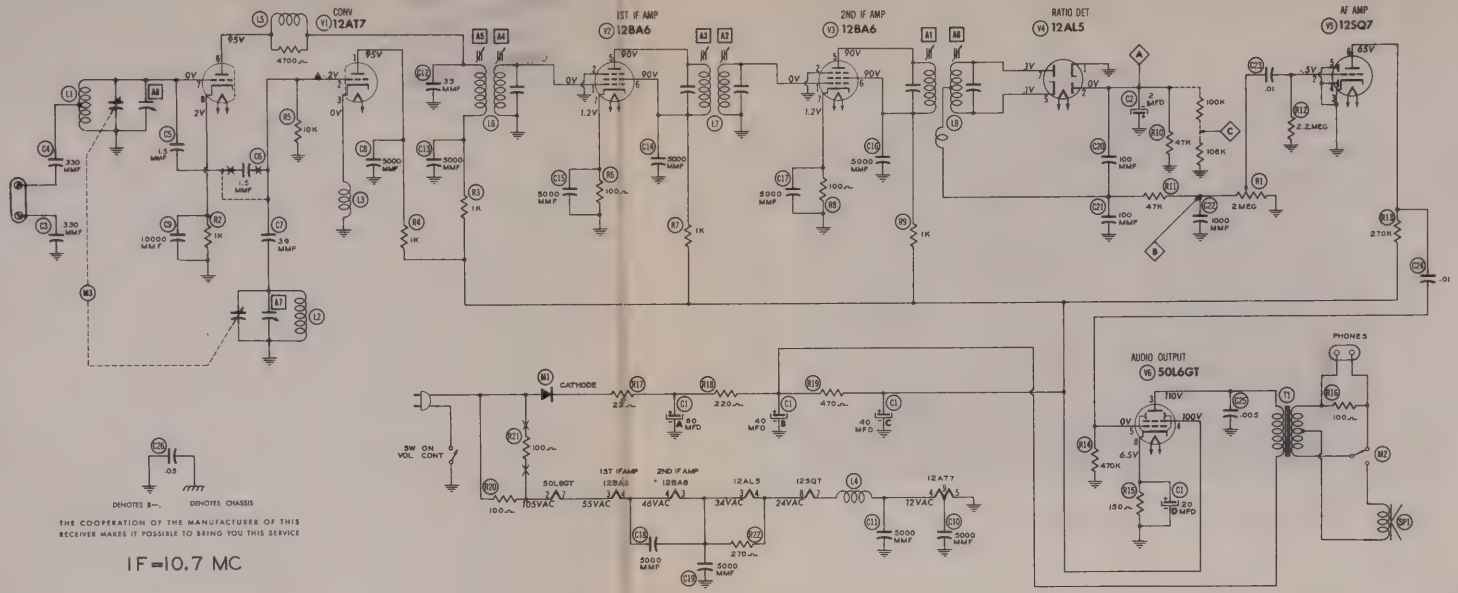
ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT	Hallicrafters PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	
M1	.070A.	27A161	NC-5	5M1	1004A	

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M2	Switch	60A243	Speaker - Phones
M3	Tuning Gang	48C278	
A7	Trimmer	44A115	Osc. Adj. (4-20MMF)
	Cabinet	66B764	
	Dial Scale	83C404	
	Dial Window	22B345	
	Dial Pointer	82A207	
	Knob	15A048	Tuning
	Knob	15A049	Volume



DIAL CORD DRIVE



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF=10.7 MC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†1.7KΩ	10KΩ	1.8Ω	12Ω	0Ω	†1.7KΩ	.1Ω	1KΩ	6Ω
V 2	12BA6	1Ω	0Ω	62Ω	50Ω	†1.7KΩ	†1.7KΩ	100Ω		
V 3	12BA6	1.2Ω	0Ω	38Ω	50Ω	†1.7KΩ	†1.7KΩ	100Ω		
V 4	12AL5	0Ω	47KΩ	38Ω	26Ω	2Meg	0Ω	2Meg		
V 5	12SQ7	0Ω	2.2Meg	0Ω	0Ω	0Ω	†270KΩ	14Ω	26Ω	
V 6	50L6GT	INF	112Ω	†390Ω	†710Ω	470KΩ	162Ω	62Ω	150Ω	

† MEASURED FROM OUTPUT OF M1

▲ TAKEN WITH VACUUM TUBE VOLTMETER

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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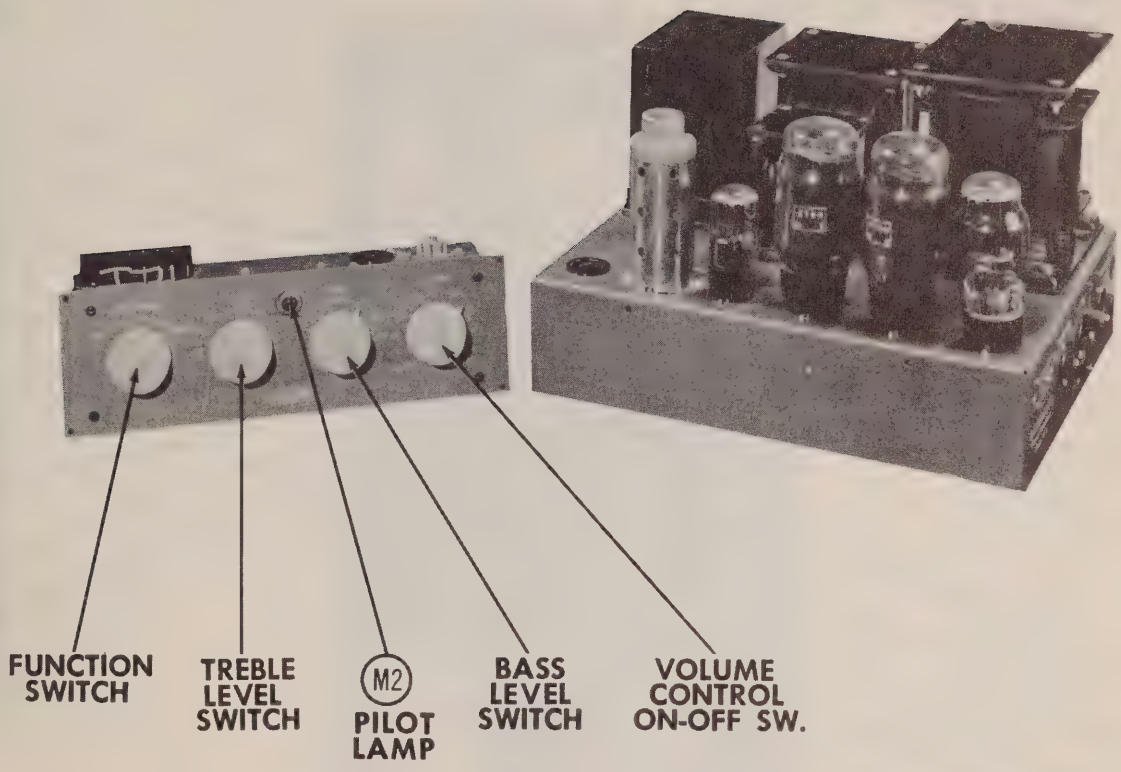
LEAK
MODEL RC/PA/U, TL/12



LEAK
MODEL RC/PA/U, TL/12

TRADE NAME	Leak Model RC/PA/U, TL/12
MANUFACTURER	H. J. Leak & Co., Ltd., London, England
TYPE SET	AC Operated 3 Channel Audio Amplifier
TUBES (Six)	Types ECC40 Pre Amp. -Tone Amp., EF36, AF Amp., ECC33 Phase Inv., (2) KT66 Audio Output GZ32 Rectifier
POWER SUPPLY	105-120 Volts AC RATING 1.3 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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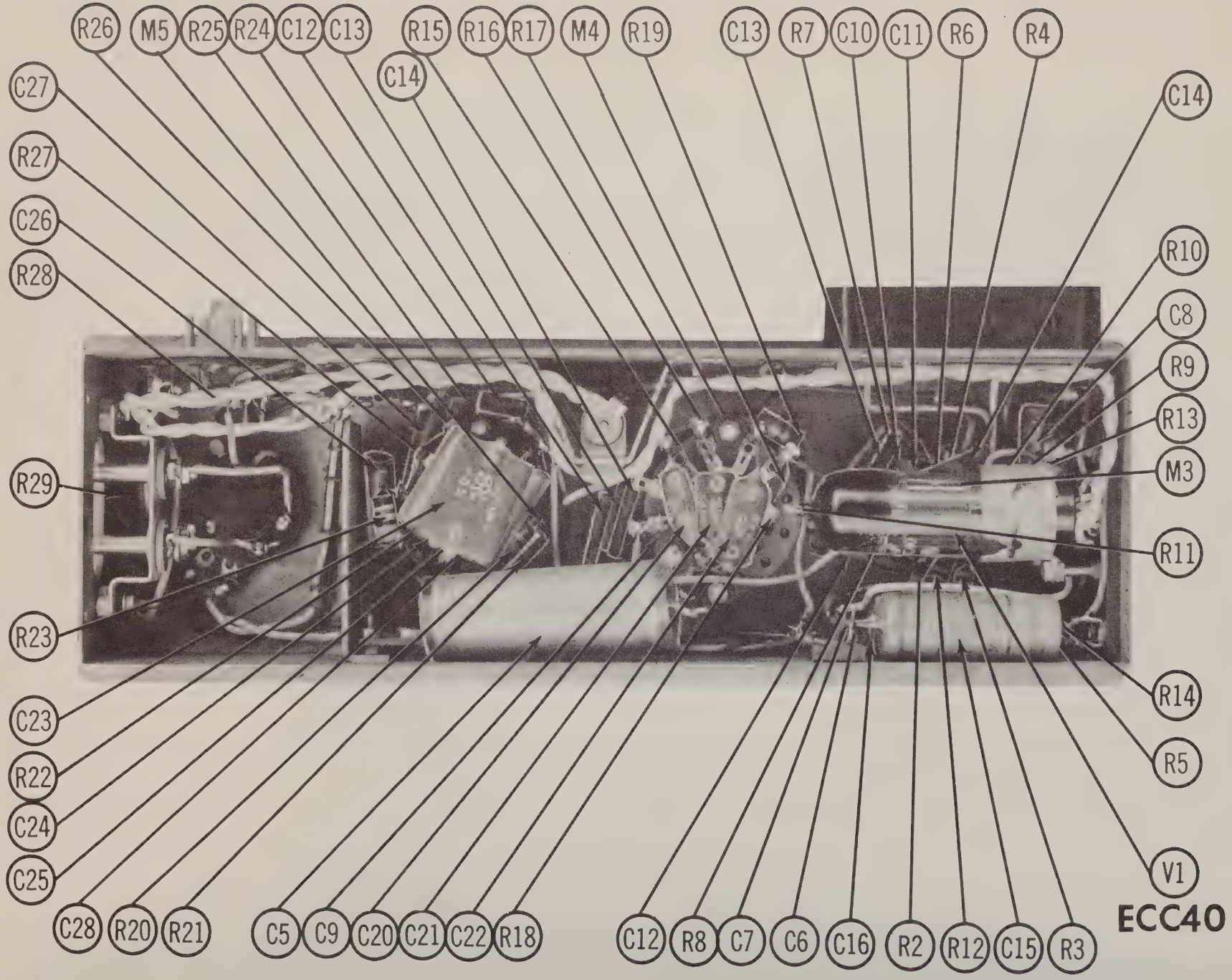
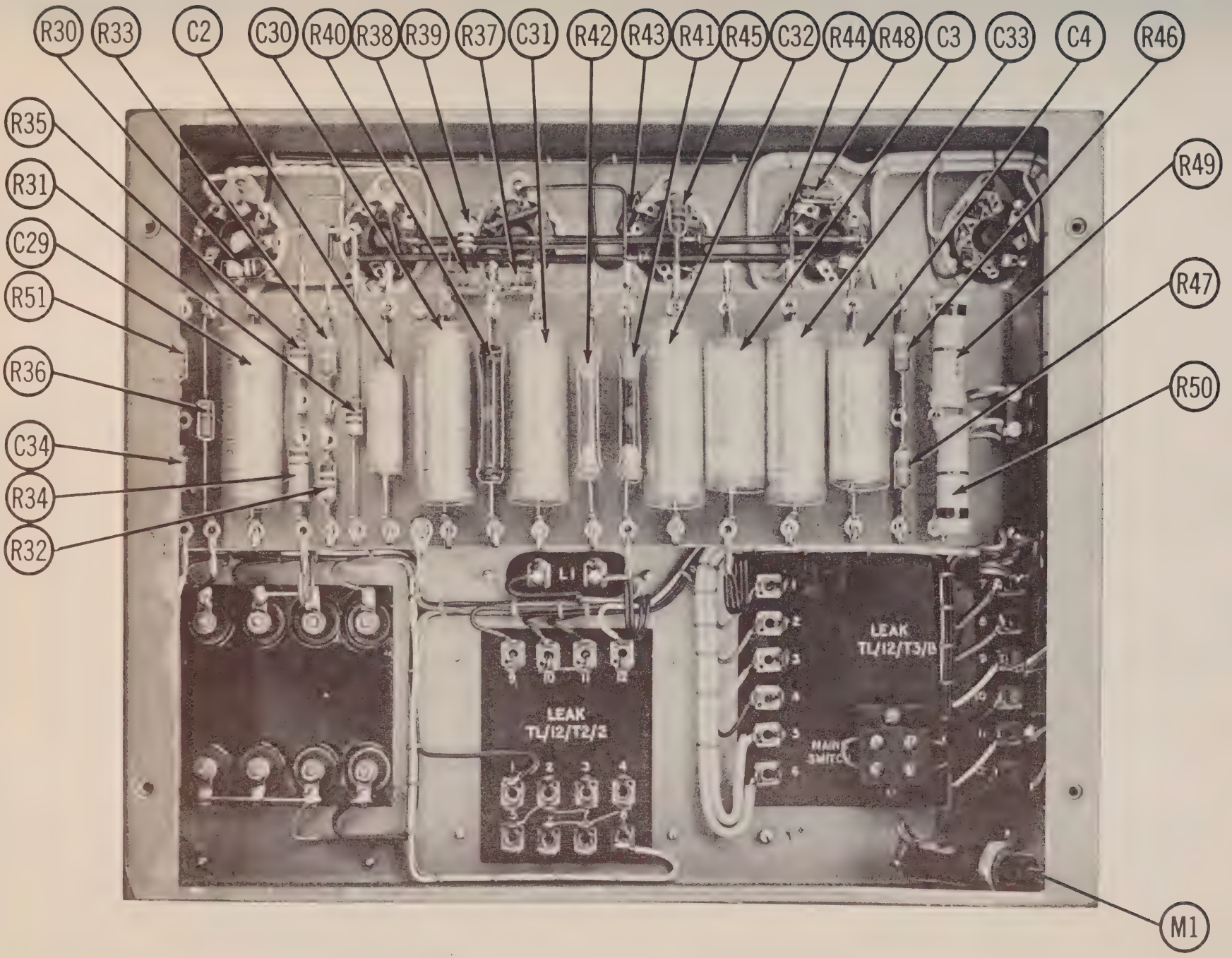
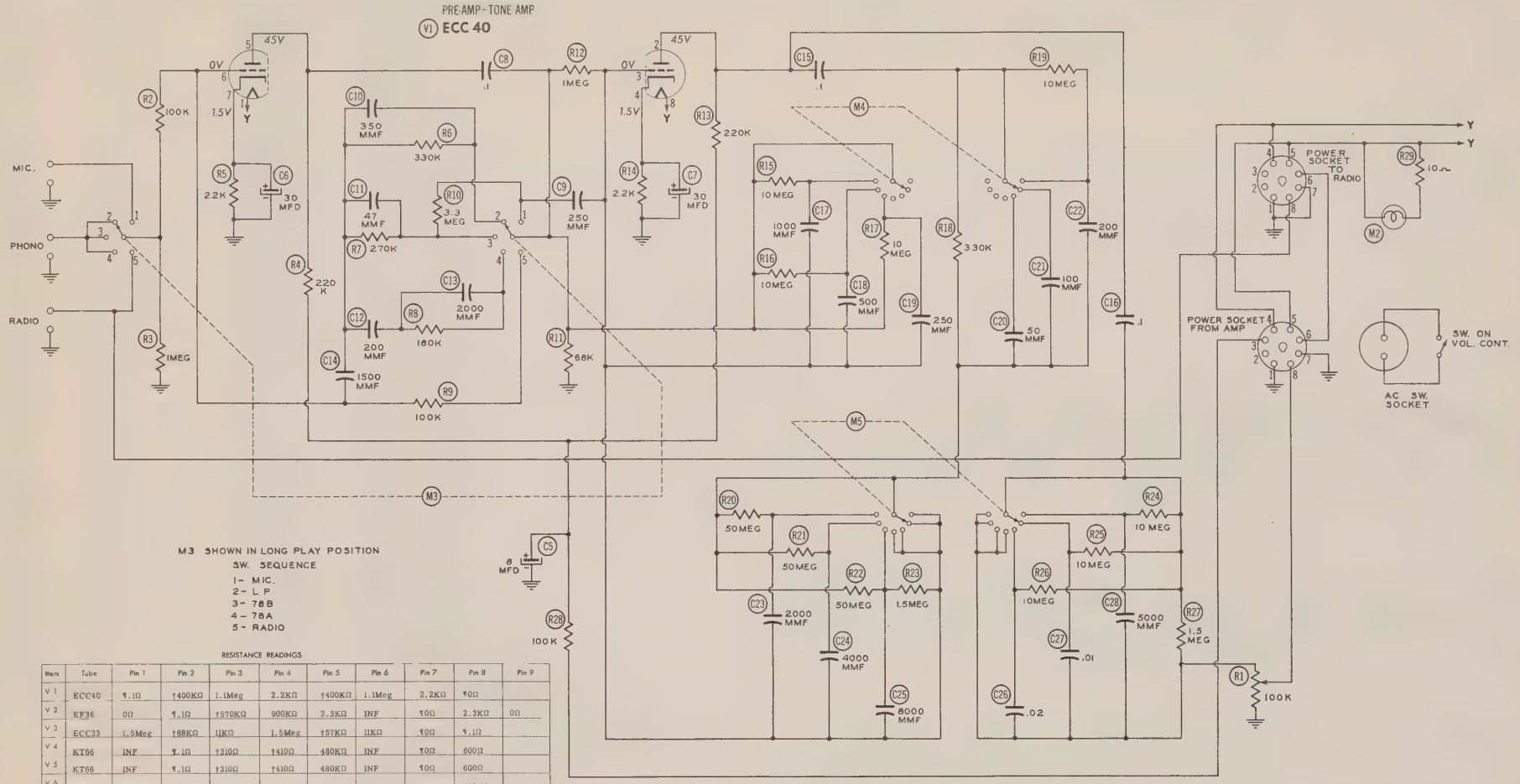

R26
M5
R25
R24
C12
C13
R15
R16
R17
M4
R19
C13
R7
C10
C11
R6
R4
C14
C27
C14
R27
C26
R10
R28
C8
R9
R13
R29
M3
R11
R23
R14
C23
R5
R22
C24
V1
C25
C28
R20
R21
C5
C9
C20
C21
C22
R18
C12
R8
C7
C6
C16
R2
R12
C15
R3
ECC40


R30
R33
C2
C30
R40
R38
R39
R37
C31
R42
R43
R41
R45
C32
R44
R48
C3
C33
C4
R46
R35
R31
C29
R51
R36
C34
R34
R32
R49
R47
R50
M1
L1
LEAK
TL/12/T2/2
LEAK
TL/12/T3/B
MAIN
SWITCH



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	ECC40	¶ .1Ω	†400KΩ	1.1Meg	2.2KΩ	†400KΩ	1.1Meg	2.2KΩ	¶0Ω	
V 2	EF36	0Ω	¶ .1Ω	†570KΩ	900KΩ	2.3KΩ	INF	¶0Ω	2.3KΩ	0Ω
V 3	ECC33	1.5Meg	†68KΩ	1MΩ	1.5Meg	†57KΩ	1MΩ	¶0Ω	¶ .1Ω	
V 4	KT66	INF	¶ .1Ω	†310Ω	†410Ω	480KΩ	INF	¶0Ω	600Ω	
V 5	KT66	INF	¶ .1Ω	†310Ω	†410Ω	480KΩ	INF	¶0Ω	600Ω	
V 6	GZ32	INF	330KΩ	INF	110Ω	INF	100Ω	INF	330KΩ	

M3 IN "MIC" POSITION
M4 & M5 IN "LEVEL" POSITION
† MEASURED FROM PIN 8 OF V6
¶ MEASURED FROM PIN 7 OF V 5

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Proper output load connected

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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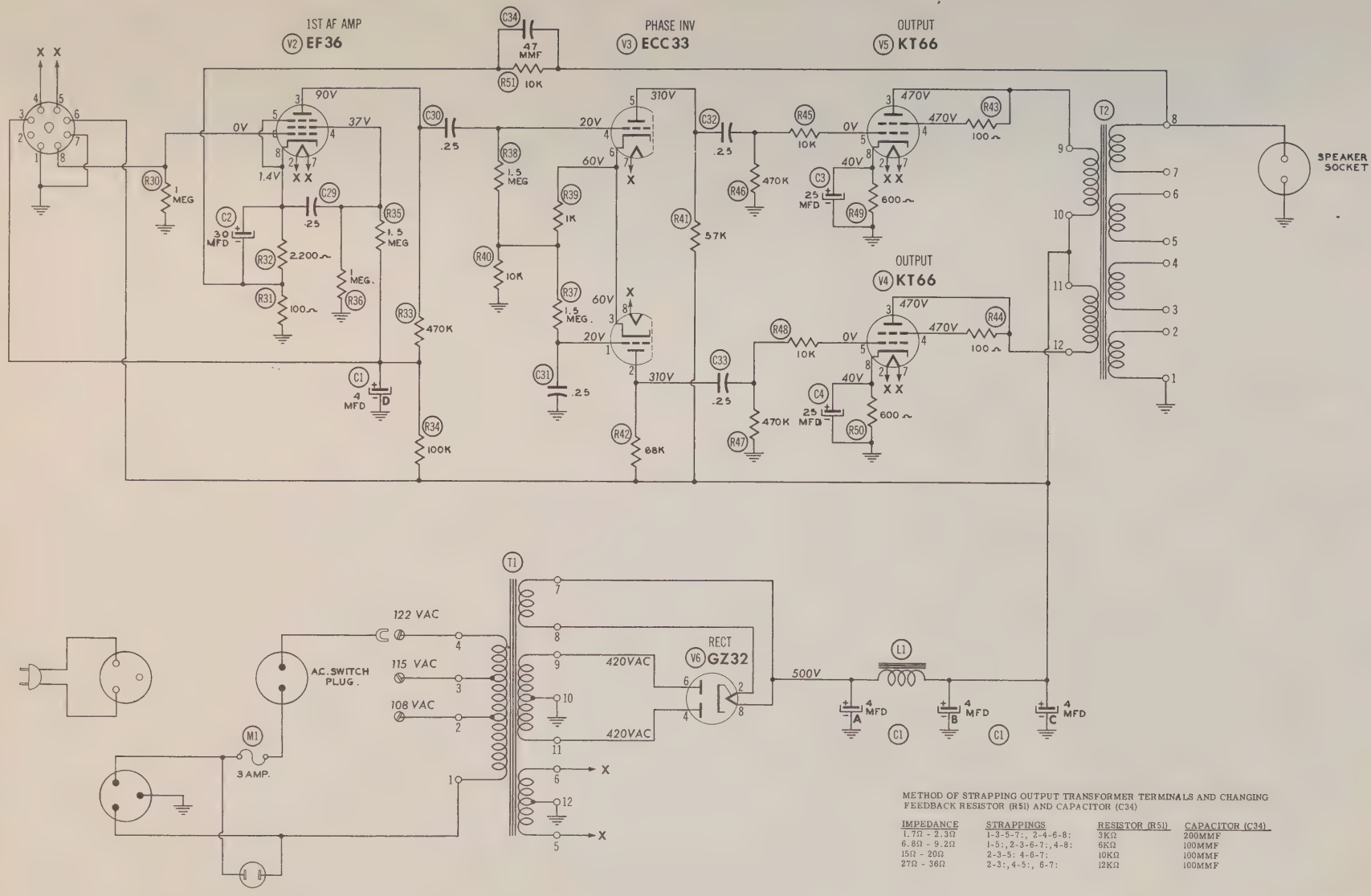

METHOD OF STRAPPING OUTPUT TRANSFORMER TERMINALS AND CHANGING FEEDBACK RESISTOR (R51) AND CAPACITOR (C34)

IMPEDANCE	STRAPPINGS	RESISTOR (R51)	CAPACITOR (C34)
1.7Ω - 2.3Ω	1-3-5-7:, 2-4-6-8:	3KΩ	200MMF
6.8Ω - 9.2Ω	1-5:, 2-3-6-7:, 4-8:	6KΩ	100MMF
15Ω - 20Ω	2-3-5: 4-6-7:	10KΩ	100MMF
27Ω - 36Ω	2-3:, 4-5:, 6-7:	12KΩ	100MMF

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		LEAK PART No.	STANDARD REPLACEMENT		
V1	Pre Amplifier - Tone Amplifier	ECC40	ECC40		
V2A	1st. AF Amplifier	EF36	EF36		
B	1st. AF Amplifier	EF37	EF37		U.S. Equivalent - 6J7
V3	Phase Inverter	ECC33	ECC33		U.S. Equivalent - 6SN7
V4A	Audio Output	KT66	KT66		U.S. Equivalent - 5881
B	Audio Output	EL37	EL37		U.S. Equivalent - 6L6
V5A	Audio Output	KT66	KT66		U.S. Equivalent - 5881
B	Audio Output	EL37	EL37		U.S. Equivalent - 6L6
V6A	Rectifier	GZ32	GZ32		U.S. Equivalent - 5U4G
B	Rectifier	U52	U52		U.S. Equivalent - 5U4G

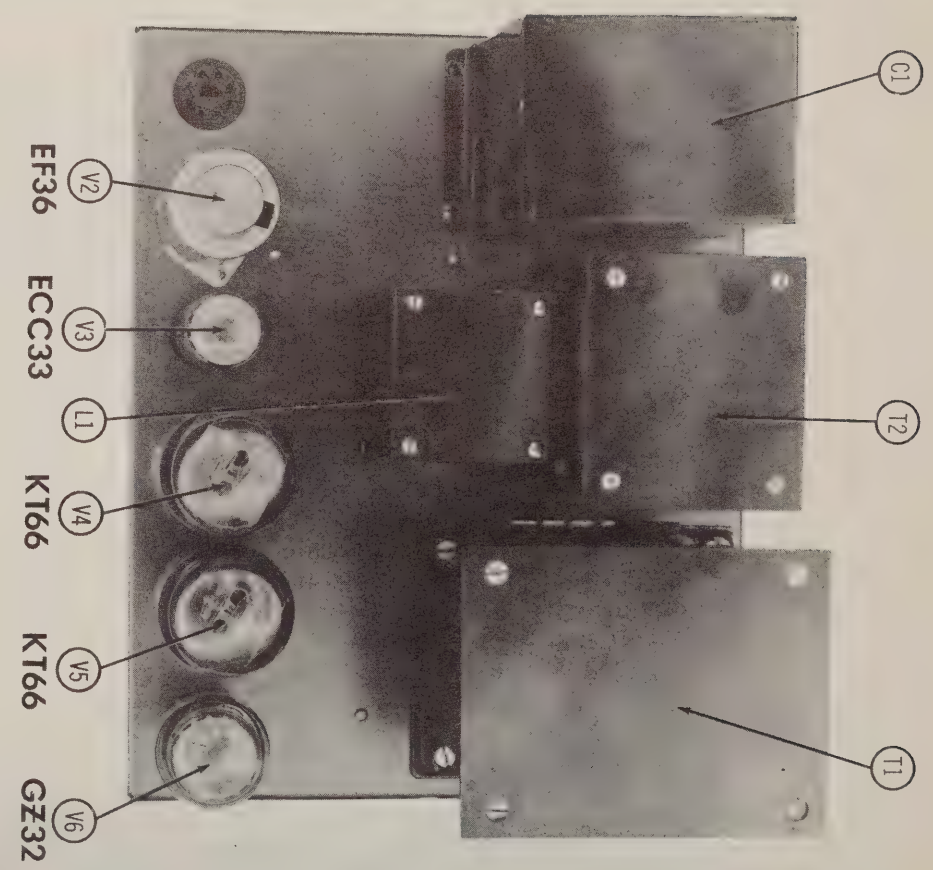
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	LEAK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	4	600		PRVC600/4		KR604			Filter
B	4	600		PRVC600/4		KR604			Filter
C	4	600		PRVC600/4		KR604			Filter
D	4	600		PRVC600/4		KR604			Decoupling
C2	30	15		PRS25/25		BR502A		TVA-1308	1st.AF Amp. Cathode †
C3	25	50		PRS50/25		BR255A		TVA-1306	Audio Output Cathode
C4	25	50		PRS50/25		BR255A		TVA-1306	Audio Output Cathode
C5	8	350		PRS350/8		BR835A		TVA-1603	Decoupling
C6	30	15							Pre Amp. Cathode
C7	30	15							Tone Amp. Cathode
C8	.1	500		P688-1	DF-104	PTE6P1		6TM-P1	Audio Coupling
C9	250	350		1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	Audio Coupling
C10	350	350		1468-00035				1FM-335	Tone Comp.
C11	47			SI47	D6-470	5W5Q5	GP1K-470	5GA-Q47	Tone Comp. ‡
C12	200	350		1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	Tone Comp.
C13	2000	350		1467-002	D6-202	1W5D2	GP2-333-202	1FM-22	Tone Comp.
C14	1500	350		1467-0015	D6-152	1W5D15	GP2L-152	1FM-215	Tone Comp.
C15	.1	350		P488-1	DF-104	PTE4P1		4TM-P1	Audio Coupling
C16	.1	350		P488-1	DF-104	PTE4P1		4TM-P1	Audio Coupling
C17	1000	350		1468-001	D6-102	1W5D1	GP2L-102	1FM-2L	Tone Comp.
C18	500	350		1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	Tone Comp.
C19	250	350		1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	Tone Comp.
C20	50	350		1468-00005	D6-500	5W5Q5	GP1K-500	1FM-45	Tone Comp.
C21	100	350		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Tone Comp.
C22	200	350		1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	Tone Comp.
C23	2000	350		1467-002	D6-202	1W5D2	GP2-333-202	1FM-22	Tone Comp.
C24	4000	350		1467-004	D6-402	1D5D4	GP2-333-402	1FM-24	Tone Comp.
C25	8000	350		1467-008		1D3D8		1FM-28	Tone Comp.
C26	.02	350		P488-02	DF-203	PTE4S2		4TM-S2	Tone Comp.
C27	.01	350		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C28	5000	350		1467-005	D6-502	1D5D5	GP2-333-502	1FM-25	Tone Comp.
C29	.25	500		684-25		GP6P25		6TM-P25	1st.AF Amp. Screen
C30	.25	500		684-25		GP6P25		6TM-P25	Audio Coupling
C31	.25	500		684-25		GP6P25		6TM-P25	2nd.AF Amp. Grid
C32	.25	500		684-25		GP6P25		6TM-P25	Audio Coupling
C33	.25	500		684-25		GP6P25		6TM-P25	Audio Coupling
C34	47								Tone Comp. ¶

† Some Models use 50MFD @ 12VDC in this application
‡ Some Models use 100MMF in this application
¶ The valve of this item depends on the load impedence of the output transformer. Replace with unit of like value.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	LEAK PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	100KΩ	½	10410	Q13-128	AG-51-Z	AN-41	Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	AK-3	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	LEAK PART No.	IRC PART No.	
R2	100KΩ	½		BTS-100K	Pre Amp. Grid
R3	1Meg	½		BTS-1Meg	Pre Amp. Grid
R4	220KΩ	½		BTS-220K	Pre Amp. Plate
R5	2200Ω	½		BTS-2200	Pre Amp. Cathode
R6	330KΩ	½		BTS-330K	Tone Compensation
R7	270KΩ	½		BTS-270K	Tone Compensation
R8	180KΩ	½		BTS-180K	Tone Compensation
R9	100KΩ	½		BTS-100K	Tone Compensation
R10	3.3Meg	½		BTS-3.3Meg	Tone Compensation
R11	68KΩ	½		BTS-68K	Tone Amp. Grid
R12	1Meg	½		BTS-1Meg	Tone Amp. Grid
R13	220KΩ	½		BTS-220K	Tone Amp. Plate
R14	2200Ω	½		BTS-2200	Tone Amp. Cathode
R15	10Meg	½		BTS-10Meg	Tone Compensation
R16	10Meg	½		BTS-10Meg	Tone Compensation
R17	10Meg	½		BTS-10Meg	Tone Compensation
R18	330KΩ	½		BTS-330K	Tone Compensation
R19	10Meg	½		BTS-10Meg	Tone Compensation
R20	50Meg	½			Tone Compensation
R21	50Meg	½			Tone Compensation
R22	50Meg	½			Tone Compensation
R23	1.5Meg	½		BTS-1.5Meg	Tone Compensation
R24	10Meg	½		BTS-10Meg	Tone Compensation
R25	10Meg	½		BTS-10Meg	Tone Compensation
R26	10Meg	½		BTS-10Meg	Tone Compensation
R27	1.5Meg	½		BTS-1.5Meg	Tone Compensation
R28	100KΩ	½		BTS-100K	Decoupling
R29	10Ω	1			Series Pilot Light
R30	1Meg	½		BTS-1Meg	1st. AF Amp. Grid
R31	100Ω	½		BTS-100	1st. AF Amp. Cathode
R32	2200Ω	½		BTS-2200	1st. AF Amp. Cathode
R33	470KΩ	½		BTS-470K	1st. AF Amp. Plate
R34	100KΩ	½		BTS-100K	Decoupling
R35	1.5Meg	½		BTS-1.5Meg	1st. AF Amp. Screen
R36	1Meg	½		BTS-1Meg	Voltage Divider
R37	1.5Meg	½		BTS-1.5Meg	2nd. AF Amp. Grid
R38	1.5Meg	½		BTS-1.5Meg	2nd. AF Amp. Grid
R39	1KΩ	½		BTS-1K	2nd. AF Amp. Cathode
R40	10KΩ	1		BTA-10K	2nd. AF Amp. Cathode
R41	57KΩ	1		BTA-56K	2nd. AF Amp. Plate
R42	68KΩ	1		BTA-68K	2nd. AF Amp. Plate
R43	100Ω	½			Parasitic Suppressor
R44	100Ω	½			Parasitic Suppressor
R45	10KΩ	½		BTS-10K	Output Grid
R46	470KΩ	½		BTS-470K	Output Grid
R47	470KΩ	½		BTS-470K	Output Grid
R48	10KΩ	½		BTS-10K	Output Grid
R49	600Ω	5		1 3/4A-600	Output Cathode - Wire Wound
R50	600Ω	5		1 3/4A-600	Output Cathode - Wire Wound
R51	10KΩ	½		BTS-10K	Feedback Network

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	LEAK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.3A	880VCT .145ADC	5VAC @ 2.0A	6.3VAC @ 4.0A	TL/12/T3/B			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		LEAK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5KΩ CT	8Ω 8Ω 8Ω 8Ω	320Ω CT	.4Ω .4Ω .4Ω .4Ω	TL/12/T2/2				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	LEAK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.145ADC	150Ω	10 Henries					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			LEAK PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		3A.			312003	341001	AGC 3	HKP

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					LEAK PART No.		
M2	Bayonet	6.5	.3	Black			

MISCELLANEOUS

ITEM No.	PART NAME	LEAK PART No.	NOTES
M3	Switch		Selector
M4	Switch		Treble
M5	Switch		Bass

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*TRADE MARK

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MODEL 5178X

SPARTON MODELS 5165X, 5166X, 5175X, 5178X, (Ch. 26SD171)

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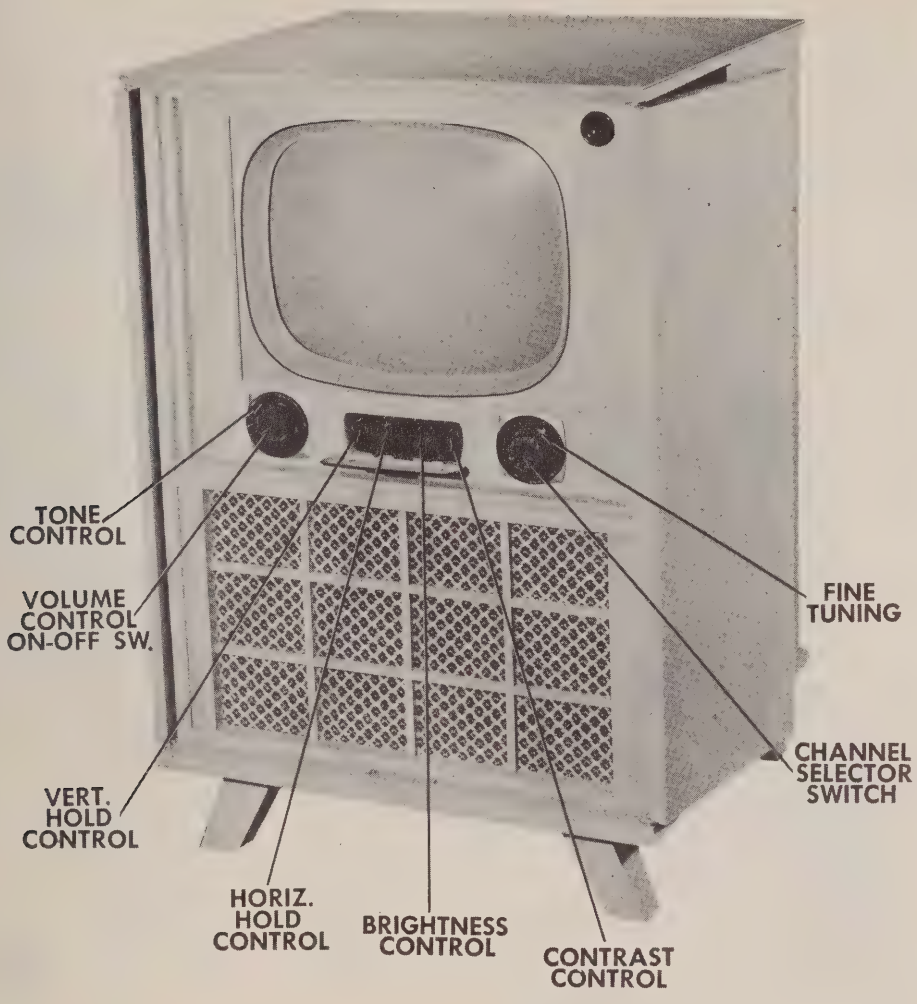
DATE 5-52 SET 166 FOLDER 13

SPARTON MODELS 5165X, 5166X, 5175X, 5178X, (Ch. 26SD171)



SPARTON MODELS 5165X, 5166X, 5175X, 5178X, (Ch. 26SD171)

SPARTON MODEL 5178X

TRADE NAME	Sparton Models 5165X, 5166X, 5175X, 5178X, (Ch.26SD171)
MANUFACTURER	Sparks-Withington Co., Jackson, Mich.
TYPE SET	Television Receiver
TUBES	Twenty Six

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.4 Amp. @117 Volts AC
TUNING RANGE—CHANNELS 2 thru 13

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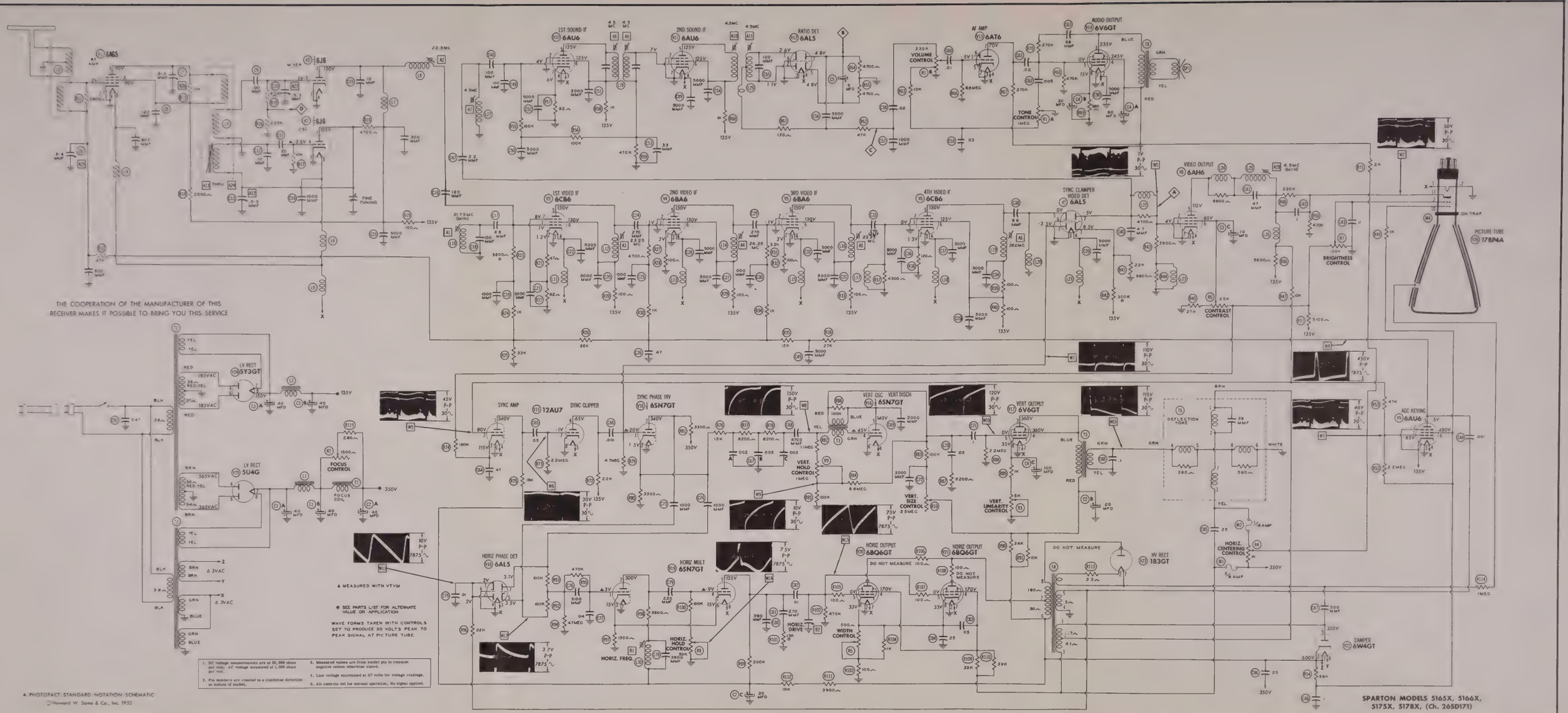
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
1ST SOUND IF V12 6AU6
2ND SOUND IF V11 6AU6
RATIO DET V12 6AL5
AF AMP V13 6AT6
AUDIO OUTPUT V14 6V6GT
330K VOLUME CONTROL
TONE CONTROL .1MEG
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6BA6
3RD VIDEO IF V5 6BA6
4TH VIDEO IF V5 6CB6
SYNC CLAMPER VIDEO DET V7 6AL5
VIDEO OUTPUT V8 6AH6
PICTURE TUBE V15 17BP4A
BRIGHTNESS CONTROL
CONTRAST CONTROL
ON TRAP
SYNC AMP V15 12AU7
SYNC CLIPPER
SYNC PHASE INV V16 6SN7GT
VERT OSC VERT DISCH V16 6SN7GT
VERT OUTPUT V17 6V6GT
VERT. HOLD CONTROL 1MEG
VERT. SIZE CONTROL 2.5MEG
VERT. LINEARITY CONTROL
DEFLECTION YOKE
HORIZ PHASE DET V18 6AL5
HORIZ MULT V19 6SN7GT
HORIZ HOLD CONTROL
HORIZ. FREQ.
HORIZ. DRIVE
WIDTH CONTROL
HORIZ OUTPUT V20 6BQ6GT
HORIZ OUTPUT V21 6BQ6GT
DO NOT MEASURE
HV RECT V23 1B3GT
HORIZ. CENTERING CONTROL
DAMPER V22 6W4GT
AGC KEYING V9 6AU6
LV RECT V24 5Y3GT
LV RECT V25 5U4G
FOCUS CONTROL
FOCUS COIL
FINE TUNING
A MEASURED WITH VTVM
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 30,000 ohms per volt; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SPARTON MODELS 5165X, 5166X, 5175X, 5178X, (Ch. 26SD171)

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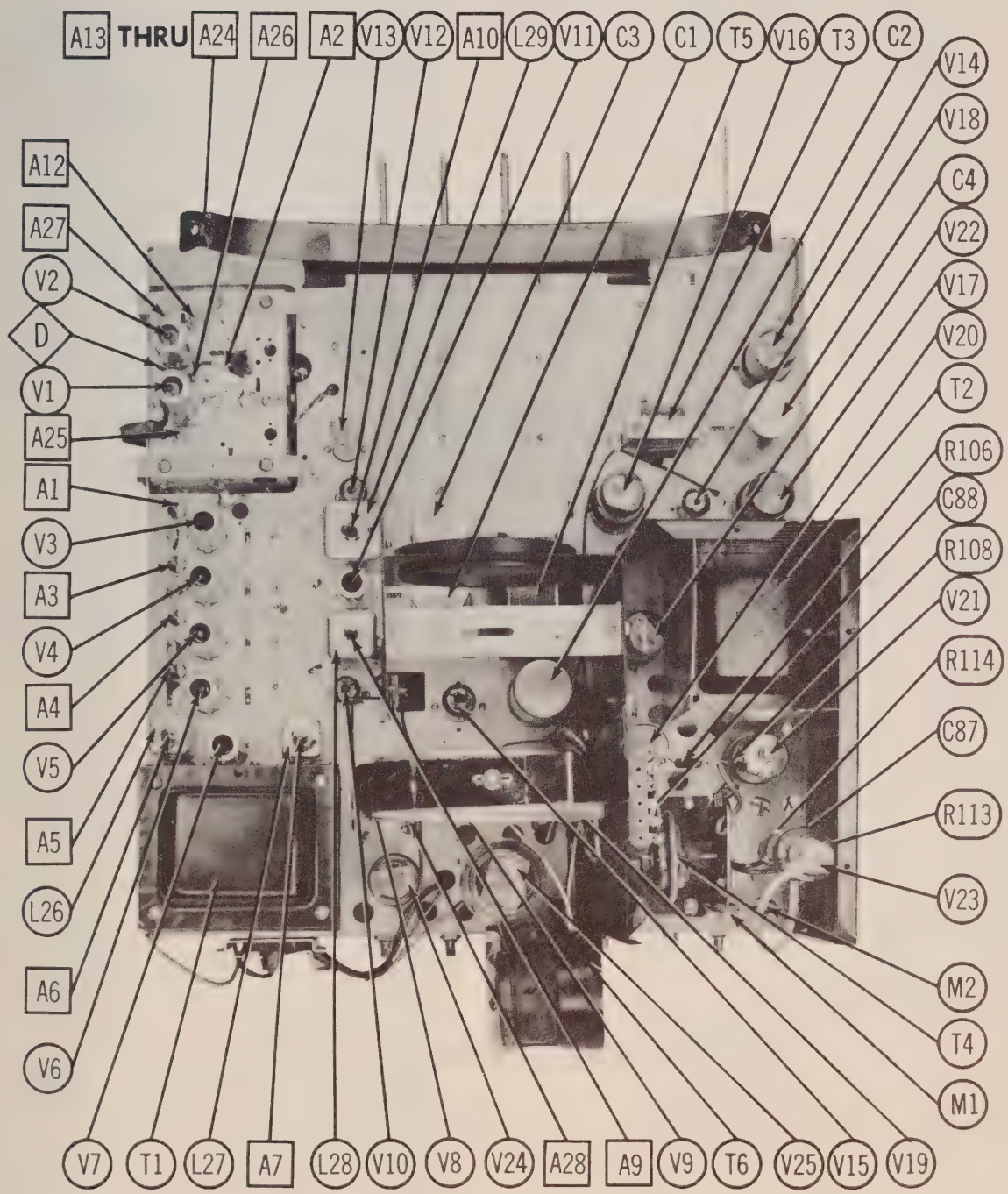
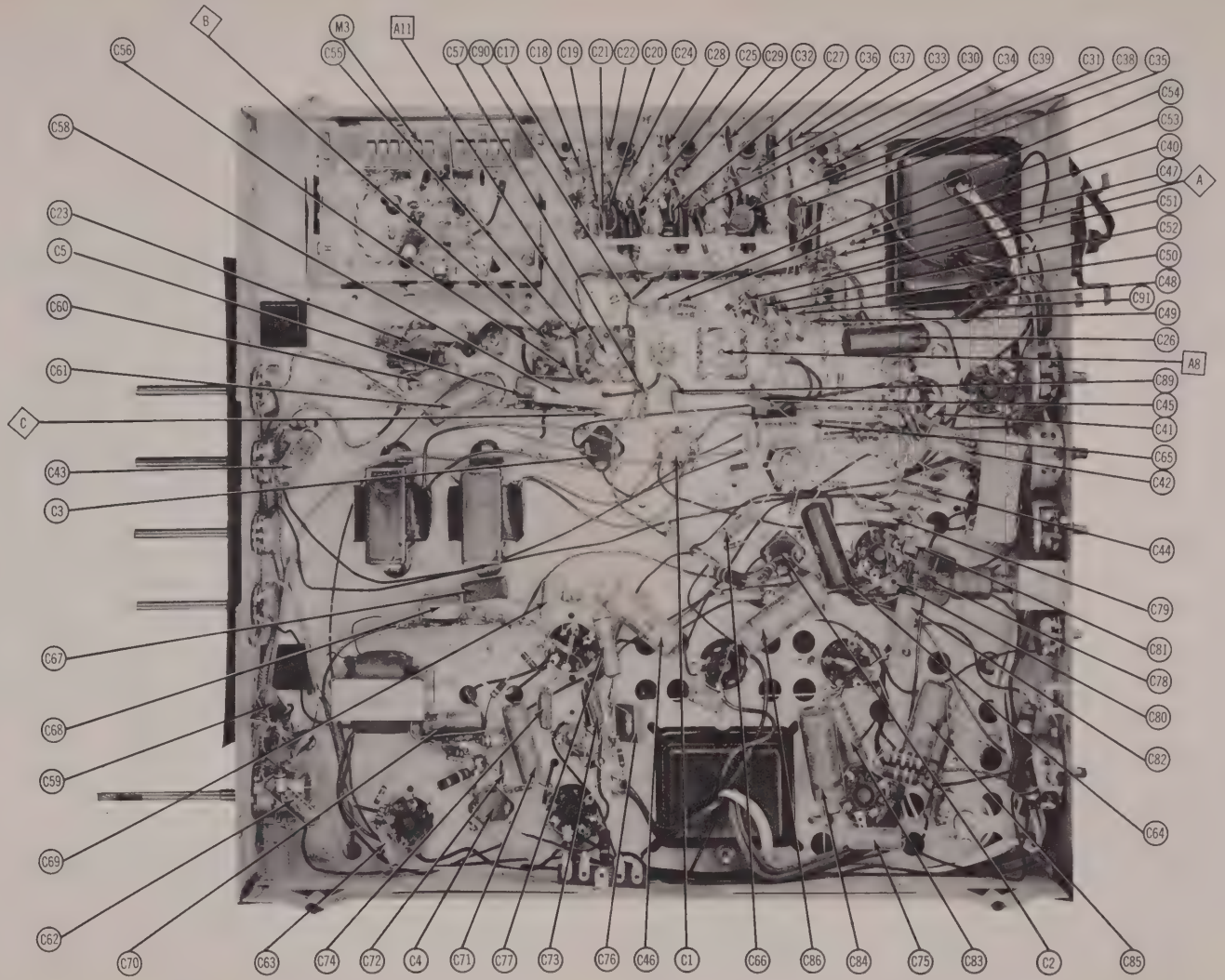
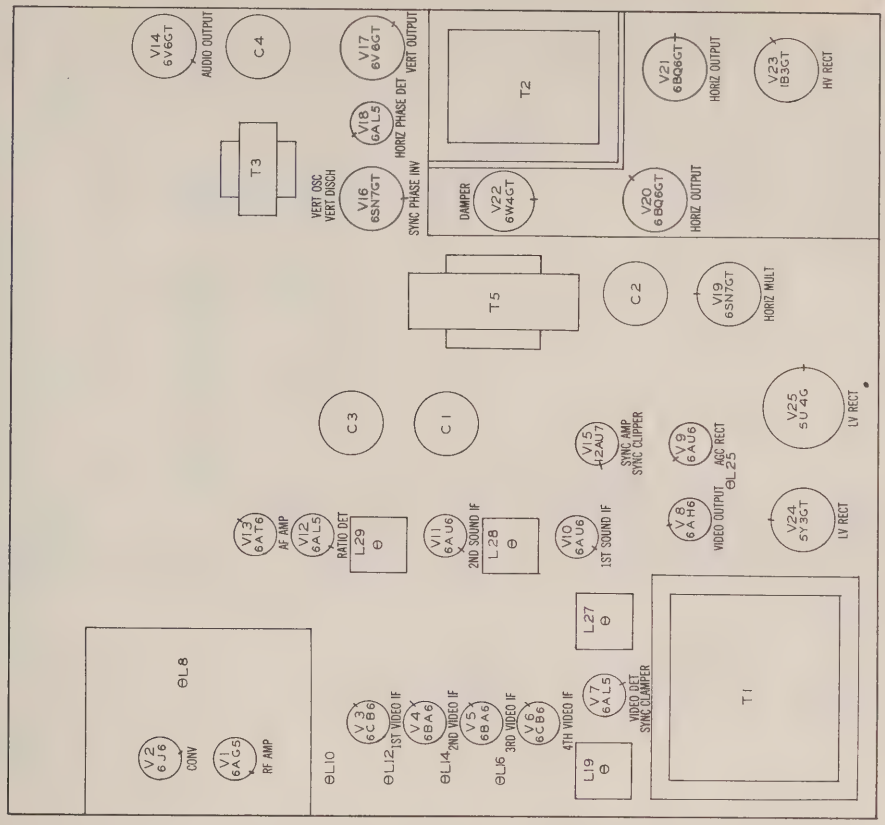


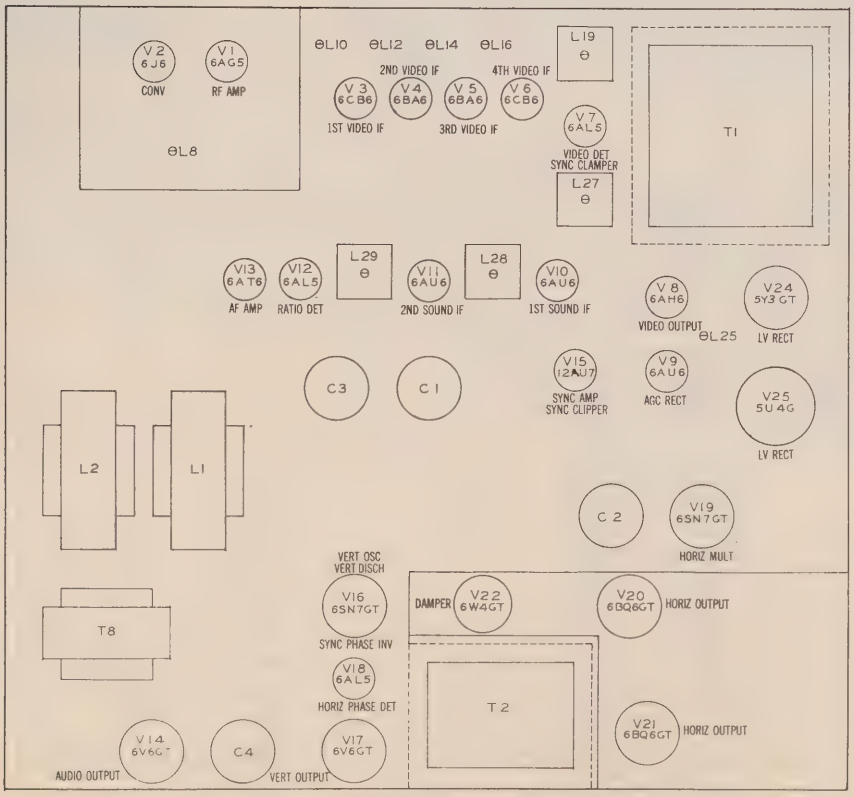
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V19) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C26, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.75MC (Unmod.)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	22.5MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	25.25MC	"	"	A3	"
4.	"	"	24.25MC	"	"	A4	"
5.	"	"	23.25MC	"	"	A5	"
6.	"	"	26MC	"	"	A6	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	25MC (10MC Swp)	21.75MC 26.25MC	Any	Vert. amp. to point (A) Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A2 thru A6 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to point (A) Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B) Common to chassis.	A7, A8, A9, A10	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C) Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10KΩ resistor	High side thru 10KΩ to Point (A) Low side to chassis.	4.5MC (450KC swp)	4.5MC	Any	Vert. amp. to Point (B) Low side to chassis.	A7, A8, A9, A10	Disconnect stabilizor capacitor C5. Adjust for maximum amplitude and symmetry as per Fig. 2.
9.	"	"	"	"	"	Vert. amp. to Point (C) Low side to chassis.	A11	Reconnect capacitor C5. Adjust A11 so 4.5MC occurs at center of crossover lines as per Fig. 3. SLIGHTLY retouch A10 for max. amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel.
If adjustment of A12 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC 215.75MC	13	Vert. amp. to Point (A) Low side to chassis.	A13	Adjust to place sound marker in trap "notch" as shown in Fig. 4. The video marker should be at 50%.
			207MC (10MC swp.)	205.25MC 209.75MC	12		A14	
			201MC (10MC swp.)	199.25MC 203.75MC	11		A15	
			195MC (10MC swp.)	193.25MC 197.75MC	10		A16	
			189MC (10MC swp.)	187.25MC 191.75MC	9		A17	
			183MC (10MC swp.)	181.25MC 185.75MC	8		A18	
			177MC (10MC swp.)	175.25MC 179.75MC	7		A19	
			85MC (10MC swp.)	83.25MC 87.75MC	6		A20	
			79MC (10MC swp.)	77.25MC 81.75MC	5		A21	
			69MC (10MC swp.)	67.25MC 71.75MC	4		A22	
			63MC (10MC swp.)	61.25MC 65.75MC	3		A23	
			57MC (10MC swp.)	55.25MC 59.75MC	2		A24	

ALIGNMENT INSTRUCTIONS (CONT.)

RF MIXER ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC swp.)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point (D). Low side to chassis.	A25, A26, A27	Adjust for response curve similar to Fig. 5 with markers above 90%.
			213MC (10MC sep.)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to Fig. 5. If markers fall below 70% on any channel, make slight adjustment of A25, A26 & A27 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC swp.)	199.25MC 203.75MC	11			
			195MC (10MC swp.)	193.25MC 197.75MC	10			
			189MC (10MC swp.)	187.25MC 191.75MC	9			
			183MC (10MC swp.)	181.25MC 185.75MC	8			
			177MC (10MC swp.)	175.25MC 179.75MC	7			
			85MC (10MC swp.)	83.25MC 87.75MC	6			
			79MC (10MC swp.)	77.25MC 81.75MC	5			
			69MC (10MC swp.)	67.25MC 71.75MC	4			
			63MC (10MC swp.)	61.25MC 65.75MC	3			
			57MC (10MC swp.)	55.25MC 59.75MC	2			

4.5MC TRAP ADJUSTMENT

After alignment is completed and set restored to original operation, tune in a strong TV station and adjust the fine tuning control until sound just begins to appear in the picture. Examine the picture for 4.5MC interference, (grain appearance in horizontal lines). If interference is present adjust A28 to eliminate it. If adjustment of A28 will not completely eliminate the interference, SLIGHTLY retouch A7 to aliminate it.

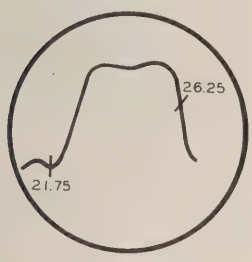


FIG.1

FIG. 2

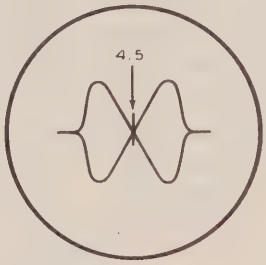


FIG. 3

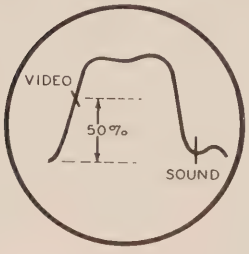


FIG.4

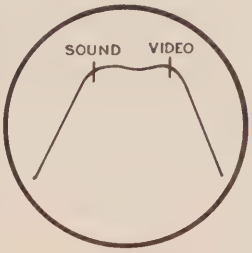
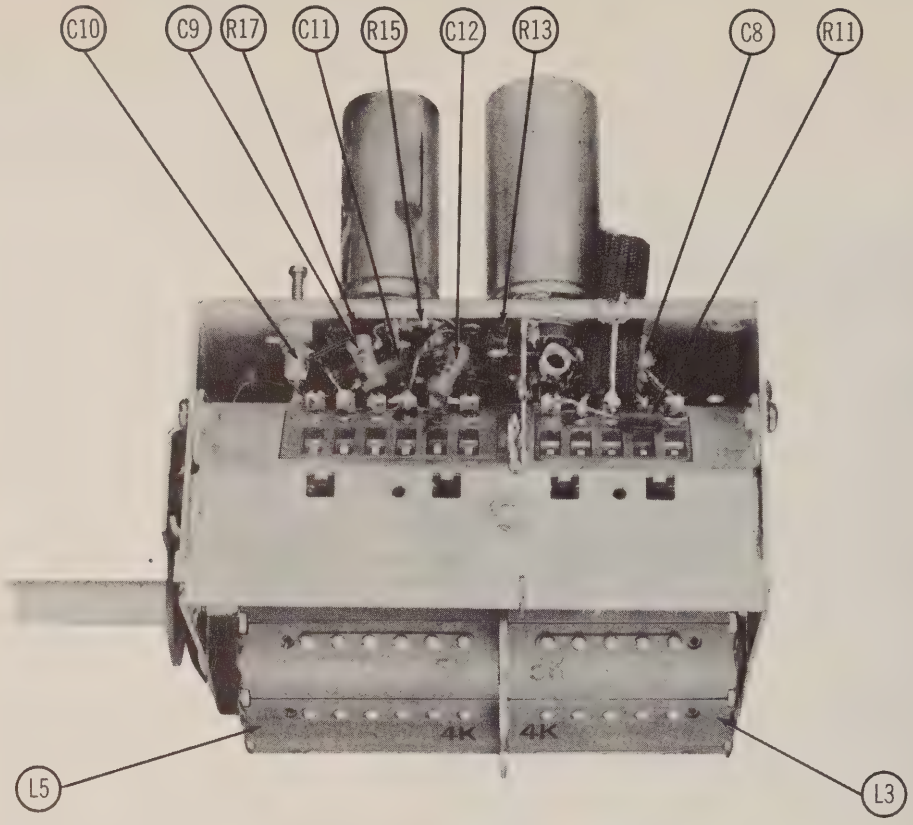


FIG. 5

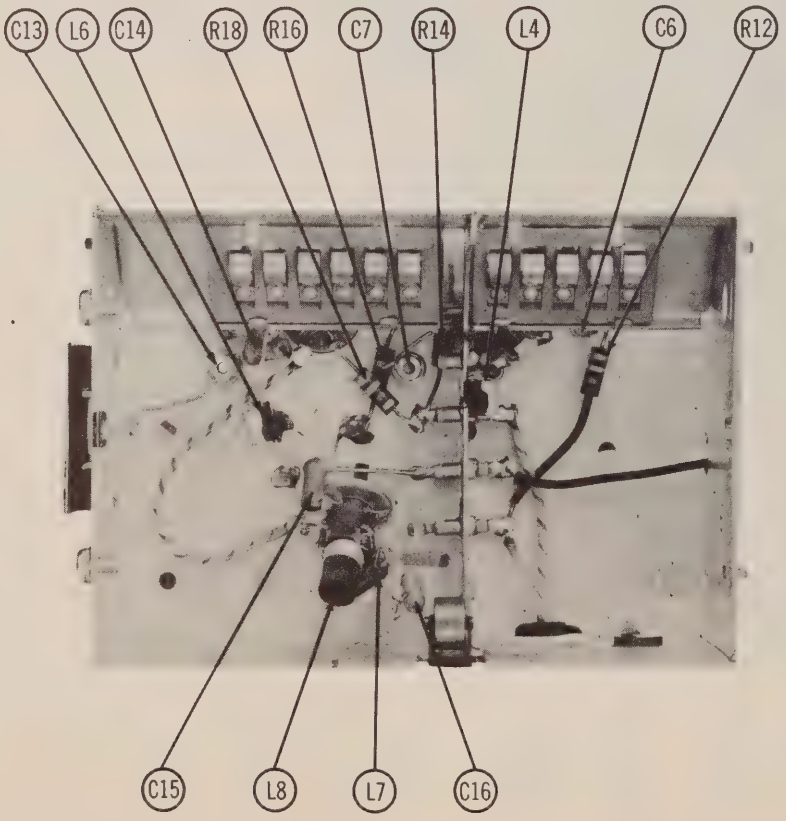
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	80KΩ	0Ω	.2Ω	0Ω	■2.4KΩ	■2.4KΩ	0Ω		
V 2	6J6	■4.9KΩ	■210Ω	.2Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	39KΩ	130Ω	0Ω	.2Ω	■210Ω	■210Ω	82Ω		
V 4	6BA6	95KΩ	0Ω	0Ω	.2Ω	■210Ω	■210Ω	100Ω		
V 5	6BA6	93KΩ	0Ω	0Ω	.2Ω	■210Ω	■210Ω	100Ω		
V 6	6CB6	2.6Ω	120Ω	0Ω	.2Ω	■310Ω	■210Ω	0Ω		
V 7	6AL5	22KΩ	3.9KΩ	0Ω	.2Ω	2.6Ω	0Ω	4.7Meg		
V 8	6AH6	3.9KΩ	0Ω	0Ω	.1Ω	■5.8KΩ	25KΩ	0Ω		
V 9	6AU6	■62KΩ	■110Ω	0Ω	.1Ω	130KΩ	#68KΩ	■110Ω		
V 10	6AU6	670KΩ	0Ω	.1Ω	0Ω	■1.1KΩ	■1.1KΩ	82Ω		
V 11	6AU6	470KΩ	0Ω	0Ω	.1Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	4.7KΩ	0Ω	4.7KΩ		
V 13	6AT6	6.8Meg	0Ω	0Ω	.1Ω	INF	INF	†270KΩ		
V 14	6V6GT	INF	.1Ω	†2.7KΩ	†2.4KΩ	470KΩ	740KΩ	0Ω	390Ω	
V 15	12AU7	#32KΩ	■15KΩ	190KΩ	.1Ω	.1Ω	■22KΩ	2.2Meg	0Ω	0Ω
V 16	6SN7GT	4.7Meg	†3.6KΩ	3.3KΩ	1.5Meg	#670KΩ	0Ω	0Ω	.1Ω	
V 17	6V6GT	INF	.1Ω	#7.6KΩ	#7.6KΩ	2.2Meg	INF	0Ω	2.2KΩ	
V 18	6AL5	22KΩ	22KΩ	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 19	6SN7GT	5.1Meg	#19KΩ	1.5KΩ	135KΩ	#210KΩ	1.5KΩ	0Ω	.1Ω	
V 20	6BQ6GT	INF	0Ω	INF	†20KΩ	470KΩ	470KΩ	.1Ω	260Ω	TOP CAP #130Ω
V 21	6BQ6GT	INF	0Ω	INF	†20KΩ	470KΩ	.1Ω	.1Ω	260Ω	TOP CAP #130Ω
V 22	6W4GT	INF	INF	360KΩ	#68KΩ	†350Ω	INF	#0Ω	#.2Ω	
V 23	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #220Ω
V 24	5Y3GT	INF	30KΩ	INF	38Ω	INF	37Ω	INF	30KΩ	
V 25	5U4G	INF	60KΩ	2.7Ω	50Ω	160KΩ	54Ω	†350Ω	60KΩ	
V 26	17BP4A	.1Ω	28KΩ	PIN 10 #69KΩ	PIN 11 160KΩ	PIN 12 0Ω				

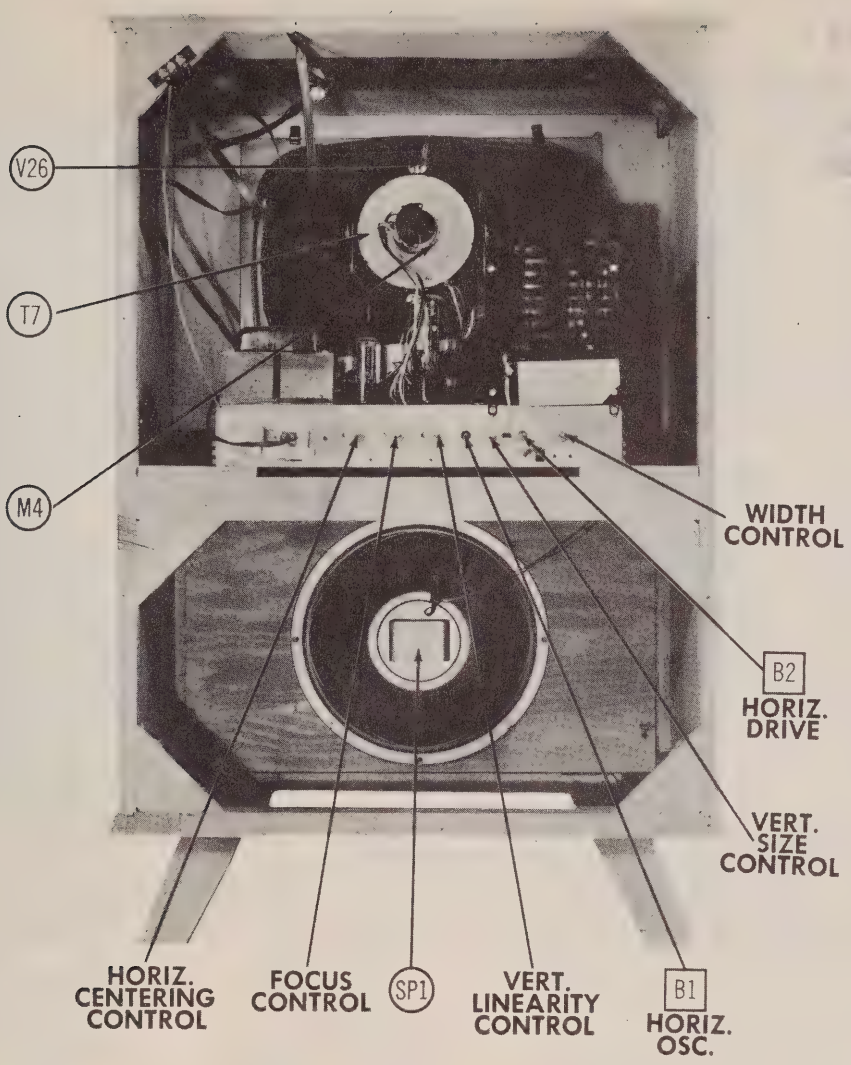
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 2 OF V25
■ MEASURED FROM PIN 8 OF V24
MEASURED FROM PIN 3 OF V22



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), to the center of the range over which the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), for best compromise between brightness and horizontal linearity.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 11 wood screws for removal of back cover.
3. Disconnect built in antenna and speaker.
4. Remove 2 wood screws holding antenna bracket. Remove bracket.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 nuts holding speaker. Remove speaker.

NOTE. FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	AF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6BA6	6BA6	7BK	
V5	3rd. Video IF Amp.	6BA6	6BA6	7BK	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector - Sync. Clamper	6AL5	6AL5	6BT	
V8	Video Output	6AS6	6AS6	7BK	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier	6AT6	6AT6	7BT	
V14	Audio Output	6V6GT	6V6GT	7AC	
V15	Sync. Amplifier - Sync. Clipper	12AU7	12AU7	9A	
V16	Vert. Oscillator - Vert. Discharge - Sync. Phase Inv.	8SN7GT	8SN7GT	8BD	
V17	Vert. Output	6V6GT	6V6GT	7AC	
V18	Horiz. Phase Det.	6AL5	6AL5	6BT	
V19	Horiz. Mult.	8SN7GT	8SN7GT	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V22	Damper	5W4GT	5W4GT	4CG	
V23	HV Rectifier	1B3GT	1B3GT	3C	
V24	LV Rectifier	5Y3GT	5Y3GT	5T	
V25	LV Rectifier	5U4GT	5U4GT	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RMA BASE TYPE	NOTES
V26	17BP4A	17BP4A 17BP4 17BP4 ① 17RP4 ②	12D	① Circuit changes necessary - Low voltage focusing circuit required. ② Zero Voltage Electrostatic focusing tube.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475		AFH2-72		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Filter
C2A	40	475		AFH3-52		UPT42H45		TVL-4840	▲ Decoupling ■ Vert. Output Dec.
B	20	450							▲ Decoupling
C	20	450							▲ Filter
C3A	40	250		AFH3-54		UPT44145		TVA-1504	▲ Filter ▲ Video Amp. Screen
B	20	250							▲ Filter
C	10	200							▲ Video Amp. Screen
C4A	80	450		AFH4-87		UPT4445 V10		TVL-2710	▲ Audio Output Dec.
B	30	50				BR205A		TVA-1310	▲ Audio Output Cathode ■ Vert. Output Cathode
C	100	50							
C5	5	50		PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C6	3-9				829-10				Variable Trimmer
C7	.5-3				829-3				Variable Trimmer
C8	120			SI120	D6-121	TM5T12	GP2K-121	5GA-T12	RF Amp., Decoupling
C9	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C10	.5-3				829-3				Variable Trimmer
C11	20			SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C12	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C13	.5-3				829-3				Variable Trimmer
C14	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Conv. Fil. Bypass
C15	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C16	120			SI120	D6-120	TM5T12	GP2K-121	5GA-T12	IF Coupling
C17	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8		IF Coupling
C18	100			SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Fixed Trimmer
C19	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	AGC Filter
C20	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	1st. Video IF Dec.
C21	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	1st. Video IF Cathode
C22	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	1st. Video IF Fil.
C23	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	RF Bypass
C24	270			SI270	D6-271		GP2K-271	5GA-T27	IF Coupling
C25	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	AGC Filter
C26	.47	200		P288-47			PJ2P5	2TM-P47	AGC Filter
C27	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	2nd Video IF Dec.
C28	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	2nd Video IF Fil.
C29	270			SI270	D6-271		GP2K-271	5GA-T27	IF Coupling
C30	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	AGC Filter
C31	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	3rd. Video IF Dec.
C32	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	3rd. Video IF Fil.
C33	270			SI270	D6-271		GP2K-271	5GA-T27	IF Coupling
C34	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	4th Video IF Plate Dec.
C35	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	4th Video IF Screen
C36	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	4th Video IF Cathode
C37	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	4th Video IF Fil.
C38	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8		IF Coupling
C39	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	Video Det. Fil. Bypass
C40	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7		Video Det. Filter
C41	47				TCZ-47		NP0L-470	5TCC-Q4	Fixed Trimmer
C42	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C43	.1	200		P288-1	DF-104	PJ2P1		2TM-P1	Picture Tube Grid
C44	.001	600		P688-001	DD-102	PTE6D1	GP2L-102	5HK-D1	Horiz. Feedback
C45	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	AGC Filter
C46	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	RF Bypass
C47	2.2				TCZ-2.2		NP0K-2R2		Sound IF Coupling
C48	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Sound IF Coupling
C49	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Voltage Divider
C50	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	AVC Filter

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	1st. Sound IF Dec.
C52	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	1st. Sound IF Cathode
C53	33								2nd Sound IF Grid
C54	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	2nd. Sound IF Dec.
C55	120				TCZ-120		NP0-333-121		Fixed Trimmer
C56	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	Diode Load Cap.
C57	1000			SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	De emphasis
C58	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C59	.03	200		P488-03		PTE4S3		4TM-S3	Tone Comp.
C60	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C61	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C62	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C63	68	500		1469-00007	D6-680	5W5GT	GP1K-680	MS-47	Tone Comp.
C64	.47	200		P288-47		PJ2P5		2TM-P47	Sync. Amp. Cathode
C65	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C66	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Sync. Coupling
C67A	.002			P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Vert. Integrator Net.
B	.005			P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Integrator Net.
C	.005			P688-005	D6-503	PTE6D5	GP2-333-503	6TM-D5	Vert. Integrator Net.
C68	4700	500		1464-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C69	2000	500		1464-002		1R5D2		MS-22	Vert. Osc. Plate
C70	.05	400		P488-05		PTE4S5		4TM-S5	Vert. Discharge
C71	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C72	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	RF Bypass
C73	1000			1468-001	D6-102	1W5D1	GP2L-102	1FM-D1	Horiz. Sync. Coupling
C74	1000			1468-001	D6-102	1W5D1	GP2L-102	1FM-D1	Horiz. Sync. Coupling
C75	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Voltage Divider
C76	5100	500		1464-005		1DR5D5		MS-25	Horiz. AFC Filter
C77	.04	200		P288-04		PTE4S4		6TM-S4	Horiz. AFC Filter
C78	3900	500		1464-004		1DR5D4			Fixed Trimmer
C79	220	500		1469-00025		5R5T25			Horiz. MV Feedback
C80	390	500		1469-0004		5R5T4		MS-34	Horiz. Discharge
C81	270	500		1469-0003		5R5T3		MS-33	Horiz. Discharge
C82	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. Sweep Coupling
C83	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Horiz. Output Screen
C84	.25	200		P488-25		PJ2P25		2TM-P25	Horiz. Output Cathode
C85	.25	400		P488-25		PTE4P25		4TM-P25	Horiz. Sweep Coupling
C86	.25	400		P488-25		PTE4P25		4TM-P25	Damper Filter
C87	500	20000		HV30C	TV3-502	MM-C20T5			HV Filter
C88	.1	200		P288-1	DF-104	PJ2P1		2TM-P1	Fixed Trimmer
C89	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	2nd. Sound IF Fil.
C90	5000			BPD-005	DD-502	TM5D5	81L-005	5HK-D5	Fil. Bypass
C91	.047	600		682ZGXY-05		PJ6347		6TM-S47	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
				Concentrikit			
R1A	1Meg		PA-4450	Bil-137 *		SBBT-661-8	Tone Control - Panel
B	330KΩ			Bi8-132K *			Volume Control - Tapped @ 85KΩ - Rear
C	Shaft end			K-137 *		Not Req.	Attach per instructions in Concentrikit
D	Switch		Not Req.	76-1 *		Not Req.	Attach per instructions in Concentrikit
R2	1500Ω	4	PA-4426-1		RTV-8	SVP-894	Focus Control - Wire Wound
R3	5000Ω	2	PA-4411	W-5000	43-5000	VK-135	Vert. Linearity Control - Wire Wound
R4	1000Ω	2	PA-4446	W-1000	43-1000	VK-129	Horiz. Centering Control - Wire Wound
R5	500Ω	4	PA-4448		RTV-25	SVP-985	Width Control - Wire Wound
R6A	25KΩ	½	PA-4442-9	Q1L-120	AG-40-8	B-26	Contrast Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R6A per instructions
R7A	100KΩ	½	PA-4445-2	Q1L-128	AG-49-8	B-40	Brightness Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R7A per instructions
R8A	50KΩ	½	PA-4444-2	Q1L-123	AG-44-8	B-31	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	At tach to R8A per instructions
R9A	1Meg	½	PA-4443-2	Q1L-137	AG-81-8	B-69	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R9A per instructions
R10A	2.5Meg	½	PA-4431	Q1L-239	AG-84-8	AN-83	Vert. Size Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R10A per instructions

* Additional parts to be used with Concentrikit

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R11	3900Ω	20%		BTS-3900	Antenna Coil Shunt
R12	47KΩ	20%		BTS-47K	AGC Network
R13	10KΩ	20%			RF Coil Shunt
R14	2200Ω	20%		BTS-2200	RF Amp. Decoupling
R15	4700Ω	20%		BTS-4700	Mixer Grid
R16	220KΩ	20%			Mixer Grid
R17	10KΩ	20%			Osc. Grid
R18	4700Ω			BTS-4700	Osc. Plate
R19	100Ω	20%		BTS-100	Decoupling
R20	100Ω	20%		BTS-100	1st. Video IF Amp. Decoupling
R21	47Ω				1st. Video IF Amp. Cathode
R22	82Ω			BTS-82	1st. Video IF Amp. Cathode
R23	5800Ω				1st. Video IF Amp. Grid - See Note 1
R24	1000Ω	20%		BTS-1000	AGC Network
R25	33KΩ			BTS-33K	AGC Network
R26	56KΩ			BTS-56K	AGC Network
R27	4700Ω	5%		BTS-4700 5%	2nd. Video IF Amp. Grid
R28	100Ω	5%		BTS-100	2nd. Video IF Amp. Cathode
R29	100Ω	20%		BTS-100	2nd. Video IF Amp. Decoupling
R30	1000Ω	20%		BTS-1000	AGC Network
R31	3300Ω	5%		BTS-3300 5%	3rd. Video IF Amp. Grid
R32	100Ω	5%		BTS-100	3rd. Video IF Amp. Cathode
R33	100Ω	20%		BTS-100	3rd. Video IF Amp. Decoupling
R34	1000Ω	20%		BTS-1000	AGC Network
R35	15KΩ	20%		BTS-15K	AGC Network
R36	27KΩ			BTS-27K	AGC Network
R37	4300Ω	5%		BTS-4300 5%	4th. Video IF Coil Shunt
R38	120Ω			BTS-120	4th. Video IF Amp. Cathode
R39	100Ω	20%		BTS-100	4th. Video IF Amp. Plate Decoupling
R40	100Ω	20%		BTS-100	4th. Video IF Amp. Decoupling
R41	22KΩ			BTS-22K	Sync. Clamper Diode Load
R42	300KΩ	5%		BTS-300K 5%	Voltage Divider - See Note 2
R43	3900Ω	5%		BTS-3900 5%	Video Det. Diode Load

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Sparton PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R44	6800Ω			BTS-6800	Video Peaking Coil Shunt
R45	27KΩ			BTS-27K	Voltage Divider
R46	5600Ω	5%		BTA-5600 5%	Video Amp. Plate
R47	10KΩ			BTS-10K	Isolation
R48	220KΩ			BTS-220K	Isolation
R49	1000Ω	20%		BTS-1000	AGC Anode Load
R50	470KΩ			BTS-470K	Picture Tube Cathode
R51	5100Ω	5%		BTS-5100 5%	Voltage Divider
R52	2.2Meg	20%		BTS-2.2Meg 20%	AGC Keying Grid
R53	47KΩ			BTS-47K	AGC Network
R54	68KΩ			BTA-68K	Decoupling
R55	100KΩ				1st. Sound IF Amp. Grid
R56	100KΩ			BTS-100K	AVC Network
R57	82Ω	5%		BTS-83 5%	1st. Sound IF Amp. Cathode
R58	1000Ω	20%		BTS-1000	1st. Sound IF Amp. Decoupling
R59	470KΩ			BTS-470K	2nd. Sound IF Amp. Grid
R60	1000Ω	20%		BTS-1000	2nd. Sound IF Amp. Decoupling
R61	150Ω	5%		BTS-150 5%	Balancing
R62	47KΩ			BTS-47K	De-emphasis
R63	10KΩ			BTS-10K	Tone Compensation
R64	4700Ω	5%		BTS-4700 5%	Ratio Det. Diode Load
R65	4700Ω	5%		BTS-4700 5%	Ratio Det. Diode Load
R66	6.8Meg	20%		BTA-6.8Meg 20%	AF Amp. Grid
R67	270KΩ			BTS-270K	AF Amp. Plate
R68	470KΩ			BTS-470K	Output Grid
R69	330Ω			BTA-390	Output Cathode
R70	270KΩ			BTS-270K	Feedback Network
R71	2000Ω	5		1 3/4A-2000	Decoupling - Wire Wound
R72	22KΩ			BTS-22K	Sync. Amp. Plate
R73	2.2Meg	20%		BTS-2.2Meg	Sync. Amp. Grid
R74	180KΩ			BTS-180K	Sync. Clipper Grid
R75	18KΩ			BTS-18K	Sync. Clipper Plate
R76	15KΩ	20%		BTS-15K	Integrator Network
R77	8200Ω			BTS-8200	Integrator Network
R78	8200Ω			BTS-8200	Integrator Network
R79	4.7Meg			BTS-4.7Meg	Sync. Phase Inv. Grid
R80	3300Ω	5%		BTS-3300 5%	Sync. Phase Inv. Cathode
R81	3300Ω	5%		BTS-3300 5%	Sync. Phase Inv. Plate
R82	1.1Meg	20%			Vert. Osc. Grid
R83	100KΩ			BTS-100K	Vert. Osc. Plate
R84	6.8Meg			BTS-6.8Meg	Voltage Divider
R85	100KΩ			BTS-100K	Voltage Divider
R86	100KΩ			BTS-100K	Transformer Shunt
R87	8200Ω			BTS-8200	Vert. Peaking
R88	2.2Meg	20%		BTS-2.2Meg	Vert. Output Grid
R89	1000Ω			BTA-1000	Vert. Output Cathode
R90	22KΩ			BTA-22K	Decoupling
R91	10KΩ	2		BTB-10K	Decoupling
R92	100KΩ			BTS-100K	Horiz. Phase Det. Diode Load
R93	100KΩ			BTS-100K	Horiz. Phase Det. Diode Load
R94	4.7Meg			BTA-4.7Meg	Horiz. Phase Det. Diode Load
R95	470KΩ			BTS-470K	Horiz. AFC Filter
R96	22KΩ			BTA-22K	Horiz. Feedback
R97	1500Ω	5%		BTS-1500 5%	Horiz. MV Cathode
R98	5600Ω	5%		BTS-5600 5%	Horiz. MV Plate
R99	200KΩ	5%		BTS-200K 5%	Horiz. MV Plate
R100	100KΩ			BTS-100K	Horiz. MV Grid
R101	12KΩ				Horiz. Peaking - See Note 3
R102	470KΩ			BTS-470K	Horiz. Output Grid
R103	100Ω	2			Horiz. Output Cathode
R104	1000Ω	2		BTB-1000	Width Control Shunt
R105	100Ω	20%			Parasitic Suppressor
R106	100Ω	20%			Parasitic Suppressor
R107	100Ω	20%			Parasitic Suppressor
R108	100Ω	20%			Parasitic Suppressor
R109	33KΩ	2		BTB-33K	Horiz. Output Screen
R110	39KΩ	2		BTB-39K	Horiz. Output Screen
R111	3900Ω			BTA-3900	Decoupling
R112	10KΩ	2		BTB-10K	Decoupling
R113	5.3Ω				HV Rectifier Filament - Wire Wound
R114	1Meg	20%			HV Filter
R115	280Ω	5		1 3/4A-300	Focus Coil Shunt - Wire Wound

Note 1. Some Models use a 3600Ω Resistor in this application
Note 2. Some Models use a 330KΩ Resistor in this application
Note 3. Some Models use a 10KΩ Resistor in this application

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
	FIELD RES.	V. C. IMP.				
SP1A	P. M.	3.4Ω	PC63000-32	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP1B	12"	1"				

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
	PRI.	SEC. 1	SEC. 2	SEC. 3				
T1	117VAC @ 1.55A	760VCT .220ADC	380VCT .110ADC	5VAC @ 2A		P-8157 ①	P-3057	
T2	117VAC @ .85A	6.3VAC @ 5A	6.3VAC @ 5A	6.3VAC @ 2A SEC. 4 5VAC @ 3A				

① Add Series Resistor to reduce plate voltage from low voltage rectifier.

SPARTON MODELS 5165X, 5166X, 5175X, 5178X (Ch. 26SD171)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	150Ω	820Ω	AB47006-4	A-8111	A-3000	TB0-3 ②	Vert. Oscillator Trans.
T4	220Ω	4.8Ω	PC70010-6		HV0-7		Horiz. Output Trans.
	Tapped ⓐ30Ω	Tapped ⓐ.7Ω			MWC-1 ③		
		SEC.2					
		3Ω					
		SEC.3					
		0Ω					
T5	660Ω	6Ω		A-8115	A-3035	TS0-1	Vert. Output Trans.
T6A	13Ω		PC70009-C	DY-8	MDF-70		Horiz. Deflection Coils
B	63Ω						Vert. Deflection Coils
T7	425Ω		PC70008-C		MF-2		Focus Coil

② Drill New Mounting Holes
③ Replace width coil with MWC-1 and use Secondary of MWC-1 as Sec. #2 of T4

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	6.4KΩ	3.4Ω	270Ω	.4Ω	AB44066-3	A-3823	A-3020	R0-303	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ↶)	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.220ADC	110Ω	6 Henries	AB47009-1	C-2327	C-2994	TR-4200②	② Drill One New Mounting Hole
L2	.110ADC	110Ω	6 Henries	AB47009-1	C-2327	C-2994	TR-4200②	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L3	Ant. Coils	0Ω				
L4	Fil. Choke	0Ω				
L5	RF, Mixer Grid & Osc. Coils	0Ω				
L6	Fil. Choke	0Ω				
L7	Plate Choke	2.8Ω				
L8	1st. Video IF	.8Ω				
L9	Fil. Choke	.1Ω				
L10	Sound Trap	0Ω			TV-150	
L11	Fil. Choke	.1Ω				
L12	2nd. Video IF	.1Ω			TV-102	
L13	Fil. Choke	.1Ω				
L14	3rd. Video IF	.1Ω			TV-103	
L15	Fil. Choke	.1Ω				
L16	4th. Video IF	.1Ω			TV-103	
L17	Grid Choke	2.6Ω				
L18	Fil. Choke	.1Ω				
L19	5th. Video IF	.4Ω			TV-102	
L20	Cath. Choke	2.6Ω				
L21	Fil. Choke	.1Ω				
L22	Peaking Coil	7.5Ω			♦ TV-184	Wound on 4.7KΩ Resistor, 146 Microhenries
L23	Peaking Coil	17.2Ω			TV-188	600 Microhenries
L24	Peaking Coil	9.5Ω			† TV-184	213 Microhenries, Wound on 6.8KΩ Resistor
L25	4.5MC Trap	1.9Ω			TV-151	
L26	Peaking Coil	14Ω			TV-188	420 Microhenries
L27	1st. Sound IF	1.7Ω				
L28	2nd. Sound IF	2.1Ω	2.1Ω		* TV-108	
L29	Ratio Det. Trans.	4.7Ω	1Ω		* TV-110	Tap at 1Ω
L30	Horiz. Osc.	58Ω			TV-163	

† Parallel with 6.8K Resistor
♦ Parallel with 4.7K Resistor
* Drill New Mounting Holes

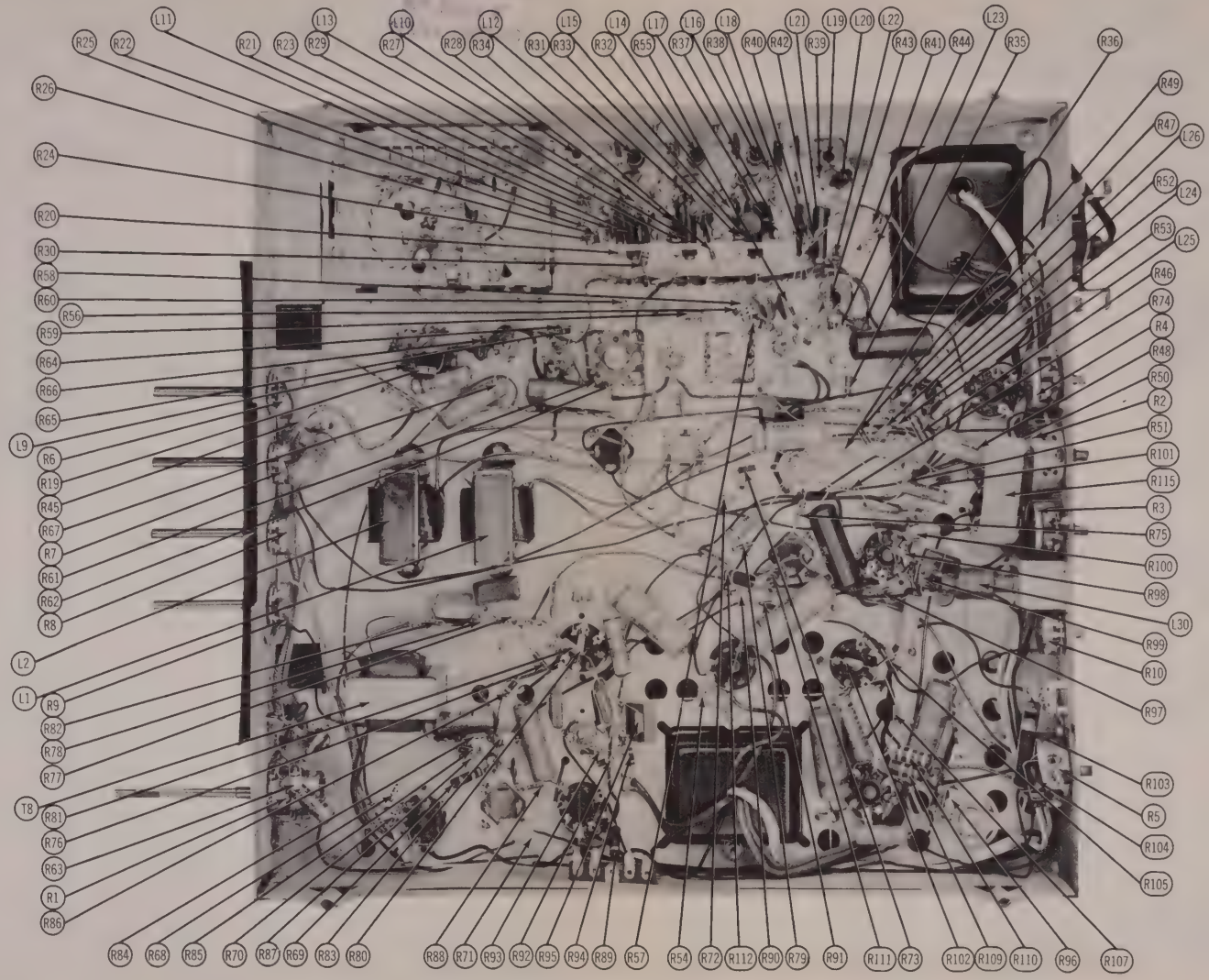
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA SPARTON PART No. FUSE	SPARTON PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG Pigtail	3/8A. 250V.	PA4212-3		318.375		GJV-3/8	
M2		1/16A. 250V.	PA4212-4		360062		GLV-1/16	

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M3	RF Tuner	PD93157	
M4	Ion Trap		
B2	Trimmer	PA4368	Horiz. Drive , (20-270MMF)
	Knob	PB40328-1	Tone
	Knob	PB40337	Off/On Volume
	Knob	PB40340	Channel Selector
	Knob	PB40333-1	Fine Tuning
	Knob	PA5651	Vert. & Horiz. Hold, Brightness, Contrast (4) Required

PROPERTY OF



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

STEWART WARNER
MODEL 9203-A

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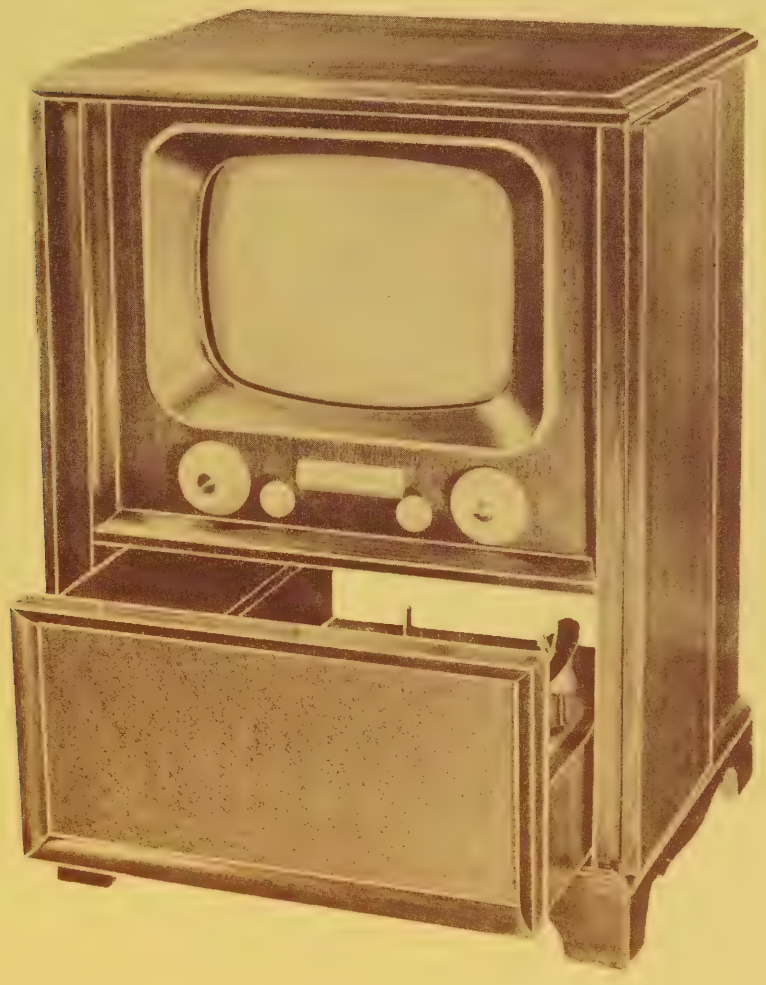

MODEL 9203-A

STEWART WARNER
MODEL 9203-A

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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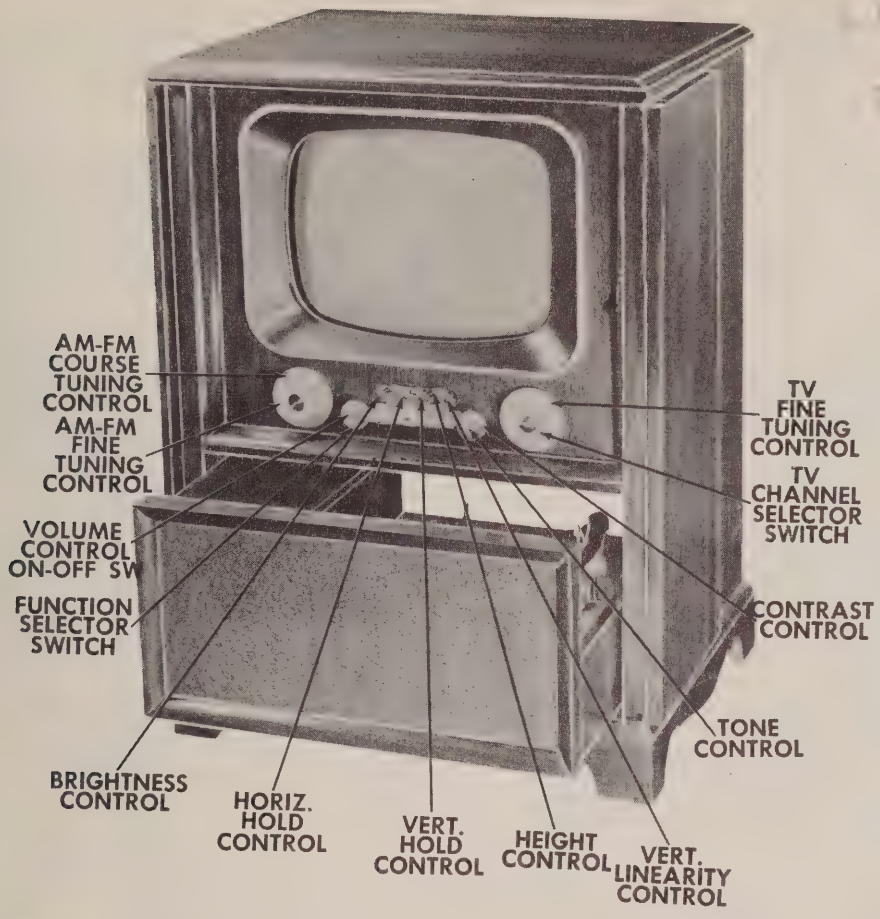
DATE 5-52 SET 166 FOLDER 14

STEWART WARNER MODEL 9203-A



STEWART WARNER MODEL 9203-A

TRADE NAME	Stewart-Warner Model 9203-A
MANUFACTURER	Stewart-Warner Elect. Div. of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	TV-FM-AM-Phono Combination Receiver
TUBES	Twenty Four
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.6 Amp. @ 117 Volts AC
TUNING RANGE	(TV) Channels 2 thru 13, (FM) 88-108MC (AM) 540-1600KC

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FOR SERVICE INFORMATION ON RECORD CHANGER SEE VM-950 PHOTOFACT SET #107 FOLDER #13 OR RECORD • CHANGER MANUAL CM-3

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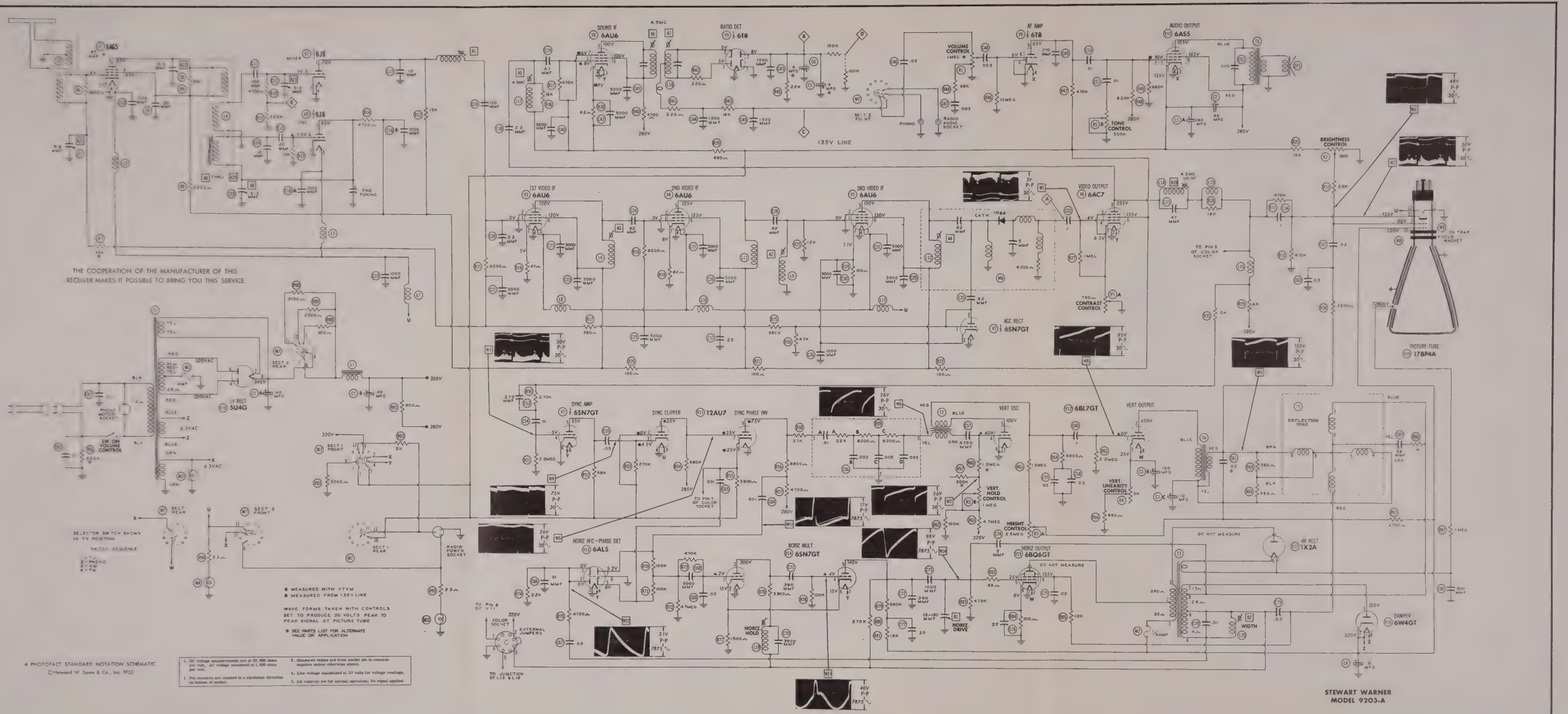
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
135V LINE
SELECTOR SWITCH SHOWN IN TV POSITION
SWITCH SEQUENCE
2 - PHONO
3 - AM
4 - FM
A MEASURED WITH VTVM
B MEASURED FROM 135V LINE
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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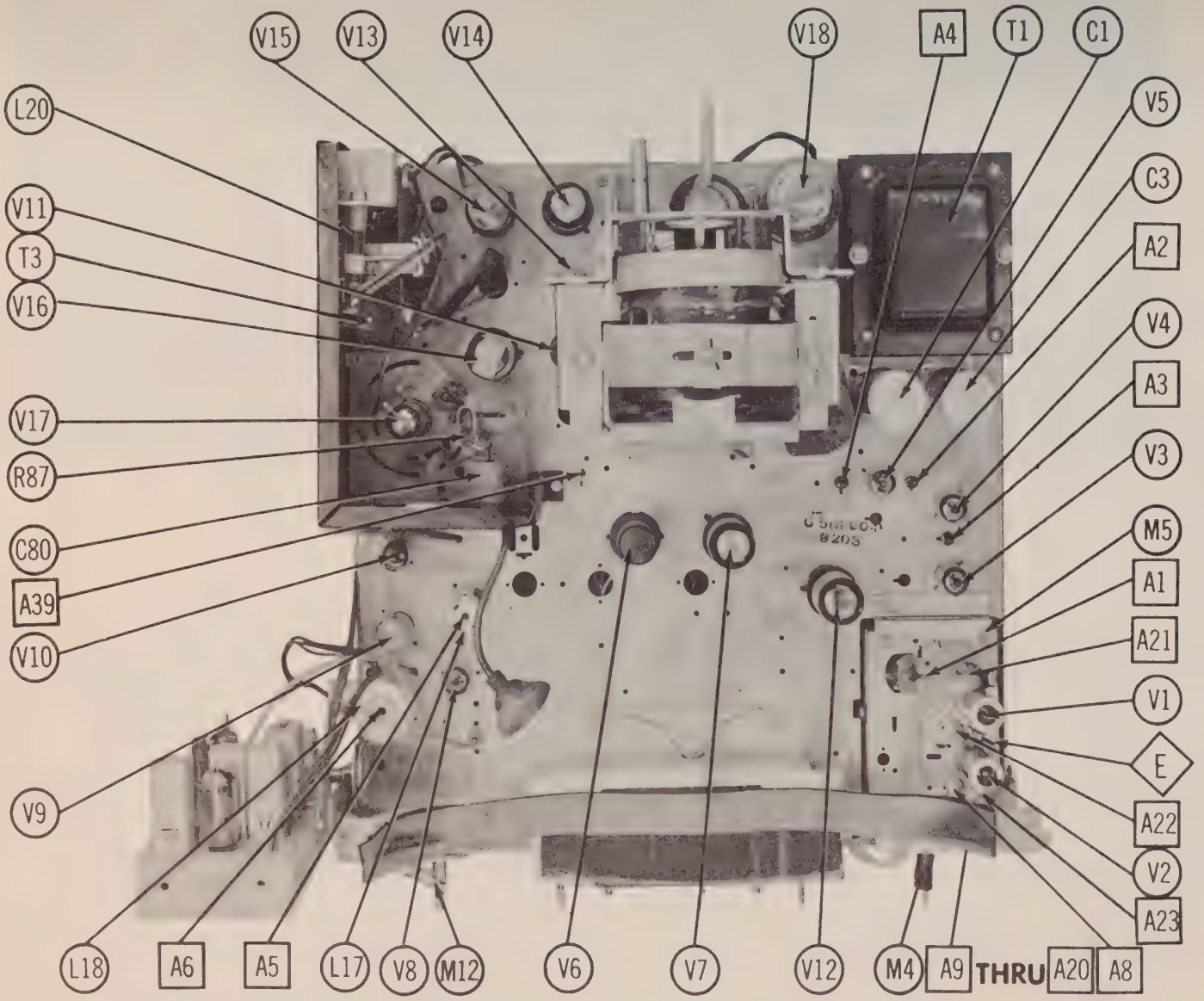
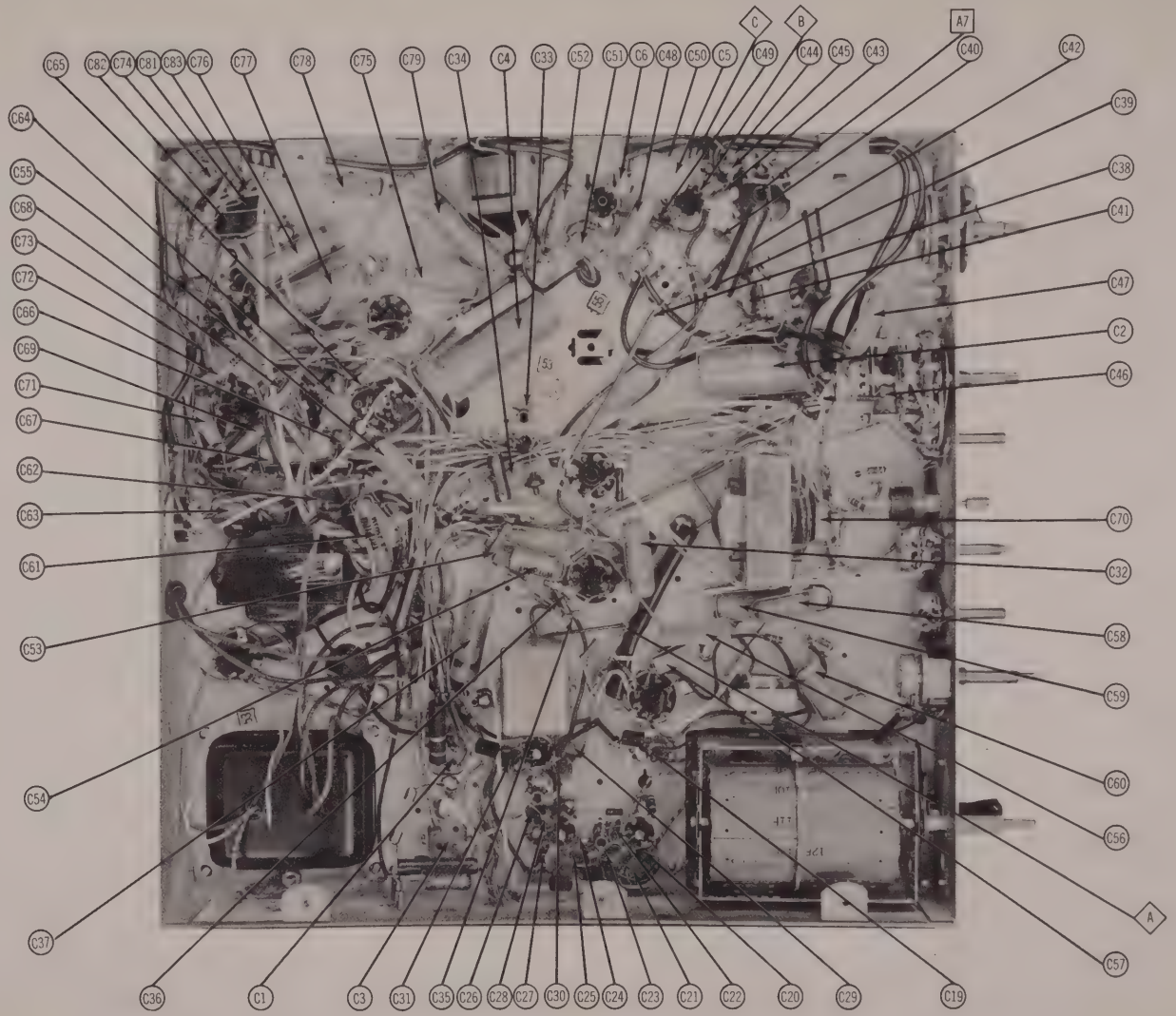
STEWART WARNER MODEL 9203-A

STEWART WARNER MODEL 9203-A



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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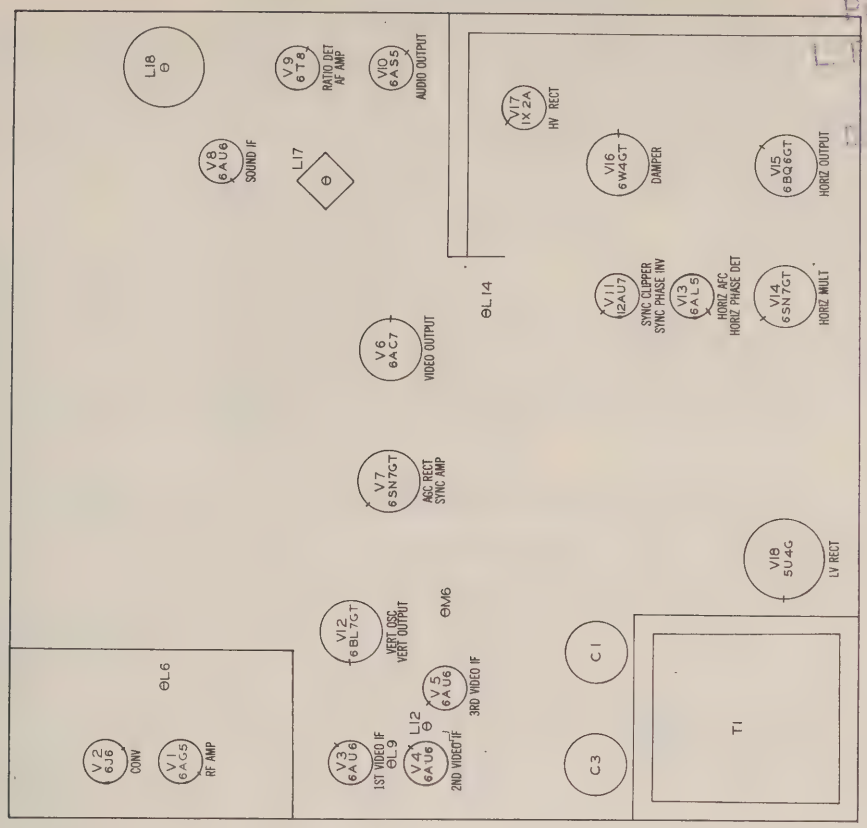
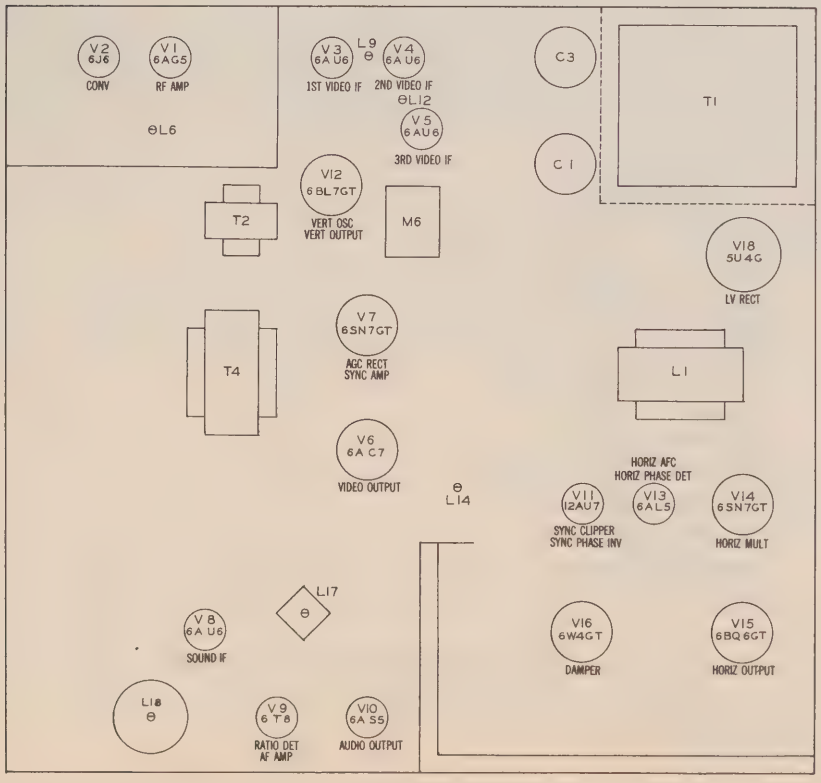
L.T. FRANKENSHIP



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

STEWART WARNER
MODEL 9203-A

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the function selector switch to TV, (fully counter-clockwise).
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V14), from its socket.

VIDEO IF ALIGNMENT

Remove the dummy converter tube, (V2), and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C37, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25.5MC (unmod.)	Any	DC probe to Point (A) Common to chassis.	A1, A2	Adjust for max. deflection.
2.	"	"	25.9MC	"	"	A3, A4	Adjust for max. deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25MC (10MC swp.)	22.25MC 26.75MC	Any	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to B-. The junction of these two resistors is alignment point (A) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to Point (A) Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (B) Common to chassis.	A5, A6	Adjust for max. deflection
5.	"	"	"	"	DC probe to Point (C) Common to Point (B).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to Point (A) Low side to chassis.	4.5MC (450KC swp)	4.5MC	Any	Vert. Amp. to Point (B) Low side to chassis.	A5, A6	Disconnect stabilizer capacitors C5 & C6. Adjust for max. amplitude and symmetry as per Fig. 2.
5.	"	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A7	Reconnect capacitors C5 & C6. Adjust A7 so 4.5MC occurs at center of crossover lines as per Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A8. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A8 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A) Low side to chassis.	A9	Adjust to place markers as shown in fig. 4.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A10	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A11	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A12	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A13	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A14	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A15	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A16	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A17	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A18	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A19	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A20	

4.5MC TRAP ADJUSTMENT

After alignment is completed, tune in a strong TV station and examine the picture for evidence of 4.5MC interference, (grain appearance in horizontal lines). If interference is present adjust A39 to eliminate or minimize it.

FIG 1

FIG. 2

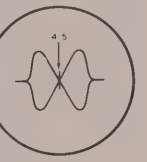


FIG. 3

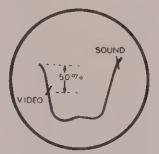


FIG. 4

FIG. 5

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF & MIXER ALIGNMENT

Connect the synchronized sweep voltage from the singal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead	207MC (10MC swp.)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point (A) Low side to chassis.	A21, A22, A23	Adjust for response curve similar to Fig. 5 with markers above 90%.
8.	"	"	213MC (10MC swp.)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustment of A21, A22, & A23 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC swp.)	199.25MC 203.75MC	11			
			195MC (10MC swp.)	193.25MC 197.75MC	10			
			189MC (10MC swp.)	187.25MC 191.75MC	9			
			183MC (10MC swp.)	181.25MC 185.75MC	8			
			177MC (10MC swp.)	175.25MC 179.75MC	7			
			85MC (10MC swp.)	83.25MC 87.75MC	6			
			79MC (10MC swp.)	77.25MC 81.25MC	5			
			69MC (10MC swp.)	67.25MC 71.75MC	4			
			63MC (10MC swp.)	61.25MC 65.75MC	3			
			57MC (10MC swp.)	55.25MC 59.75MC	2			

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Since the dial position indicator is on the cabinet, it becomes necessary to install a temporary pointer on the chassis.
Wrap a heavy piece of wire around the planetary unit mounting bracket and position the free end in front of the pilot light so it is in the same relative position as the indicator on the cabinet, (centered over the tuning shaft).
Place the tuning knob on the shaft and turn the tuning gang fully closed. The wire pointer should cast a shadow on the dial scale just to the left of the letters "AM" on the dial.
If it does not loosen the set screws on the gang drive drum and position the dial correctly. Tighten set screws.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.1MFD	High side to stator on AM RF section of tuning gang. Low side to chassis.	455KC (400% mod.)	AM (Third pos. CW)	Tuning gang fully open.	Across voice coil.	A24, A25, A26, A27	Adjust for maximum output.
10.		Loop	1500KC	"	1500KC	"	A28, A29	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
11.		"	600KC	"	600KC	"	A30	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to Pin 1 (grid) of 6BA6, (V22). Low side to chassis.	10.7MC (unmod.)	FM (max. CW)	Tuning gang fully closed.	DC probe to Point (G) Common to chassis.	A31, A32, A33	Adjust for max. deflection.
13.	"	High side to Pin 2 (grid) of 12AT7, (V20). Low side to chassis.	'	"	"	"	A34, A35	'
14.	"	"	"	"	"	DC probe to Point (G) Common to Point (H)	A36	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
12.	.01MFD	High side to pin 1 (grid), of 6BA6, (V22). Low side to chassis.	10.7MC (450KC Swp)	FM (Max.CW)	Point of non-interference.	Vert. Amp. to point (F) Low side to chassis.	A31, A32, A33	Disconnect stabilizer capacitor C84. Adjust maximum amplitude & symmetry as per fig. 6.
13.	"	High side to pin 2, (grid), of 12AT7, (V20). Low side to chassis.	"	"	"	"	A34, A35	"
14.	"	"	"	"	"	Vert. Amp. to point (G) Low side to chassis.	A36	Reconnect capacitor C84. Adjust A36 so 10.7 occurs at center of crossover lines as per fig. 7. SLIGHTLY retouch A31 for maximum amplitude & straightness of crossover lines.

FM RF ALIGNMENT

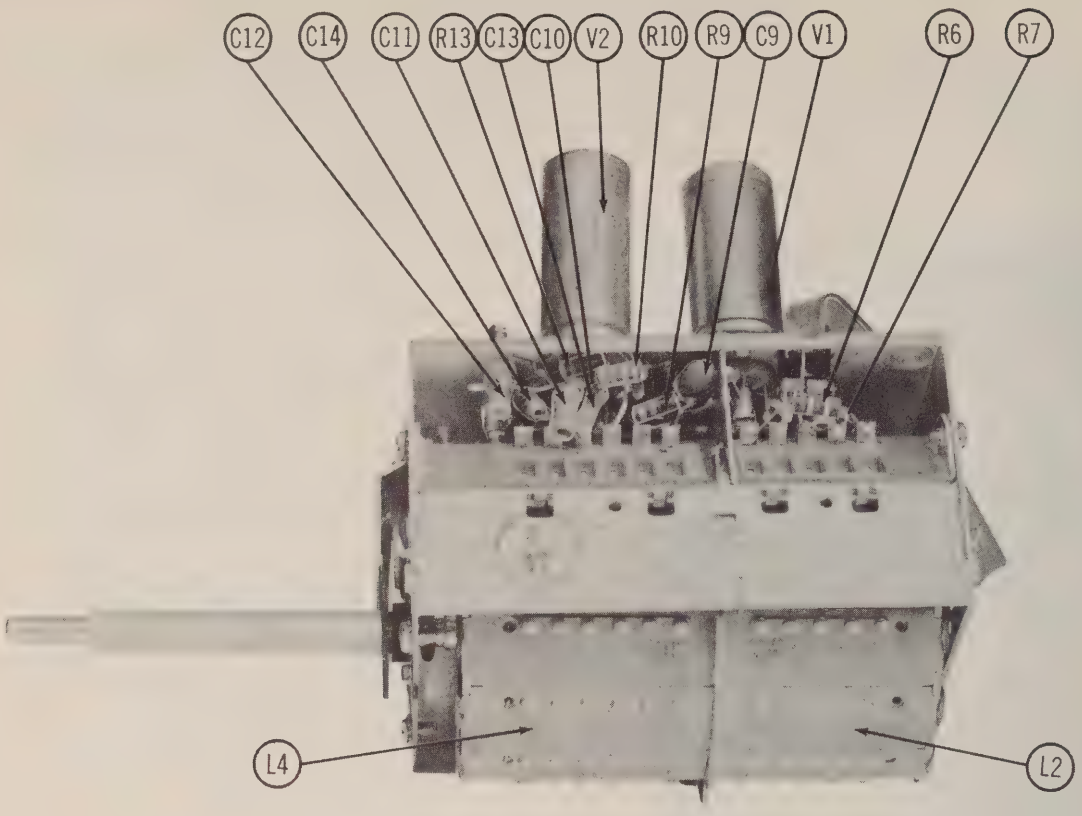
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
15.	270Ω carbon resistor	High side thru 270Ω to FM ant. terminal	108MC	FM	108MC	DC probe to point (F) Common to chassis.	A37	Adjust for max. deflection.
16.	"	"	106MC	"	Tune for max. deflection.	"	A38	' "
17.	"	"	88MC	"	88MC	"	L24, L25	Check coils with a tuning wand. If necessary expand or compress coil turns for max. deflection. If coils are changed, repeat steps 15, 16, &17 until no further improvement can be made.

STEWART WARNER
MODEL 9203-A

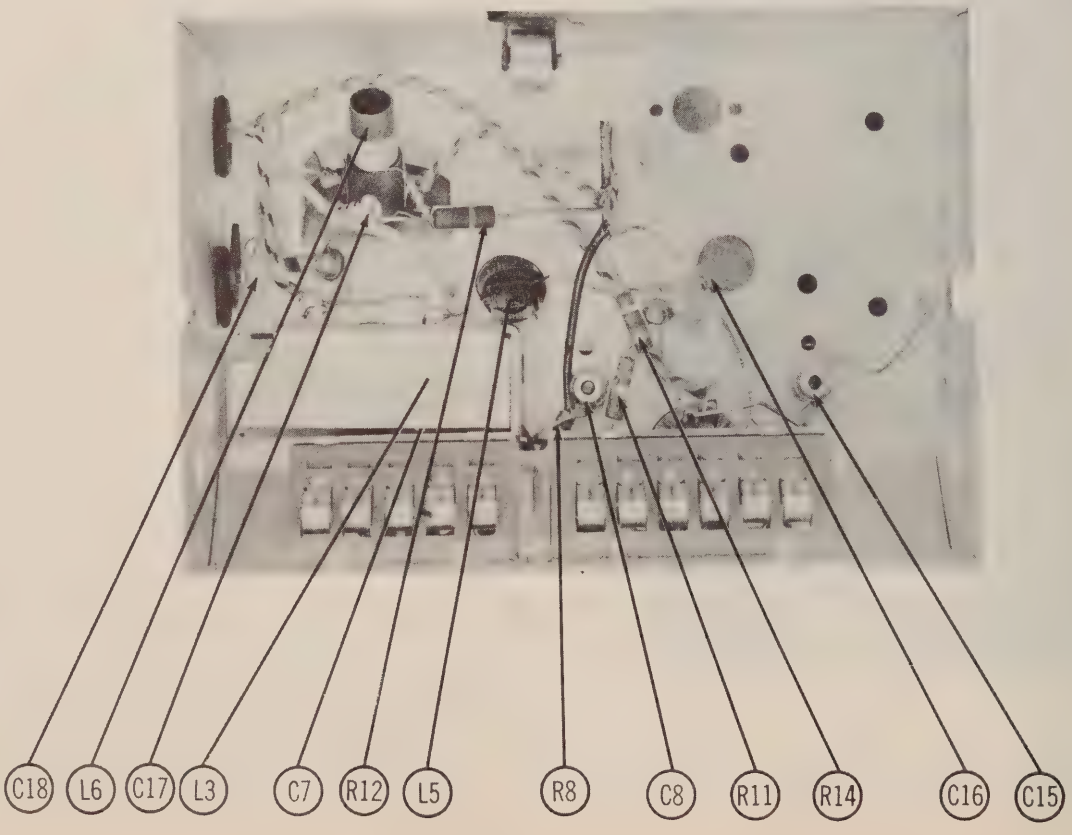
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	650KΩ	0Ω	.2Ω	0Ω	■2.5KΩ	■2.5KΩ	0Ω		
V 2	6J6	■5KΩ	■15KΩ	.2Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	600KΩ	0Ω	.1Ω	0Ω	■300Ω	■300Ω	47Ω		
V 4	6AU6	600KΩ	0Ω	.1Ω	0Ω	■200Ω	■200Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	.1Ω	0Ω	■100Ω	■100Ω	100Ω		
V 6	6AC7	0Ω	0Ω	250Ω	1Meg	250Ω	■0Ω	.1Ω	†4KΩ	
V 7	6SN7GT	47KΩ	47KΩ	100Ω	2.2Meg	■68KΩ	0Ω	0Ω	.1Ω	
V 8	6AU6	■470KΩ	■680Ω	.1Ω	0Ω	†5.3KΩ	†5.3KΩ	■760Ω		
V 9	6T8	INF	22KΩ	INF	.1Ω	0Ω	0Ω	0Ω	10Meg	■470KΩ
V 10	6AS5	45KΩ	440KΩ	.1Ω	0Ω	440KΩ	†600Ω	†1KΩ		
V 11	12AU7	†680KΩ	■0Ω	■270KΩ	0Ω	0Ω	†12KΩ	†680KΩ	■3.9KΩ	.1Ω
V 12	6BL7GT	2.2Meg	#3.5KΩ	1.4KΩ	2.3Meg	#2.5Meg	0Ω	0Ω	.1Ω	
V 13	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 14	6SN7GT	5.1Meg	†3.4KΩ	1.5KΩ	100KΩ	†250KΩ	1.5KΩ	.1Ω	0Ω	
V 15	6BQ6GT	INF	.1Ω	INF	†12KΩ	470KΩ	470KΩ	0Ω	100Ω	TOP CAP #40Ω
V 16	6W4GT	INF	INF	340KΩ	INF	†78Ω	#0Ω	#0Ω	#.1Ω	
V 17	1X2A	PINS 1 THROUGH 9 HAVE INF RESISTANCE								TOP CAP #300Ω
V 18	5U4G	#0Ω	80KΩ	INF	28Ω	INF	30Ω	†0Ω	80KΩ	
V 19	17BP4A	0Ω	40KΩ	PIN 10 #0Ω	PIN 11 290KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V18
# MEASURED FROM PIN 3 OF V 16
■ MEASURED FROM 135 VDC LINE

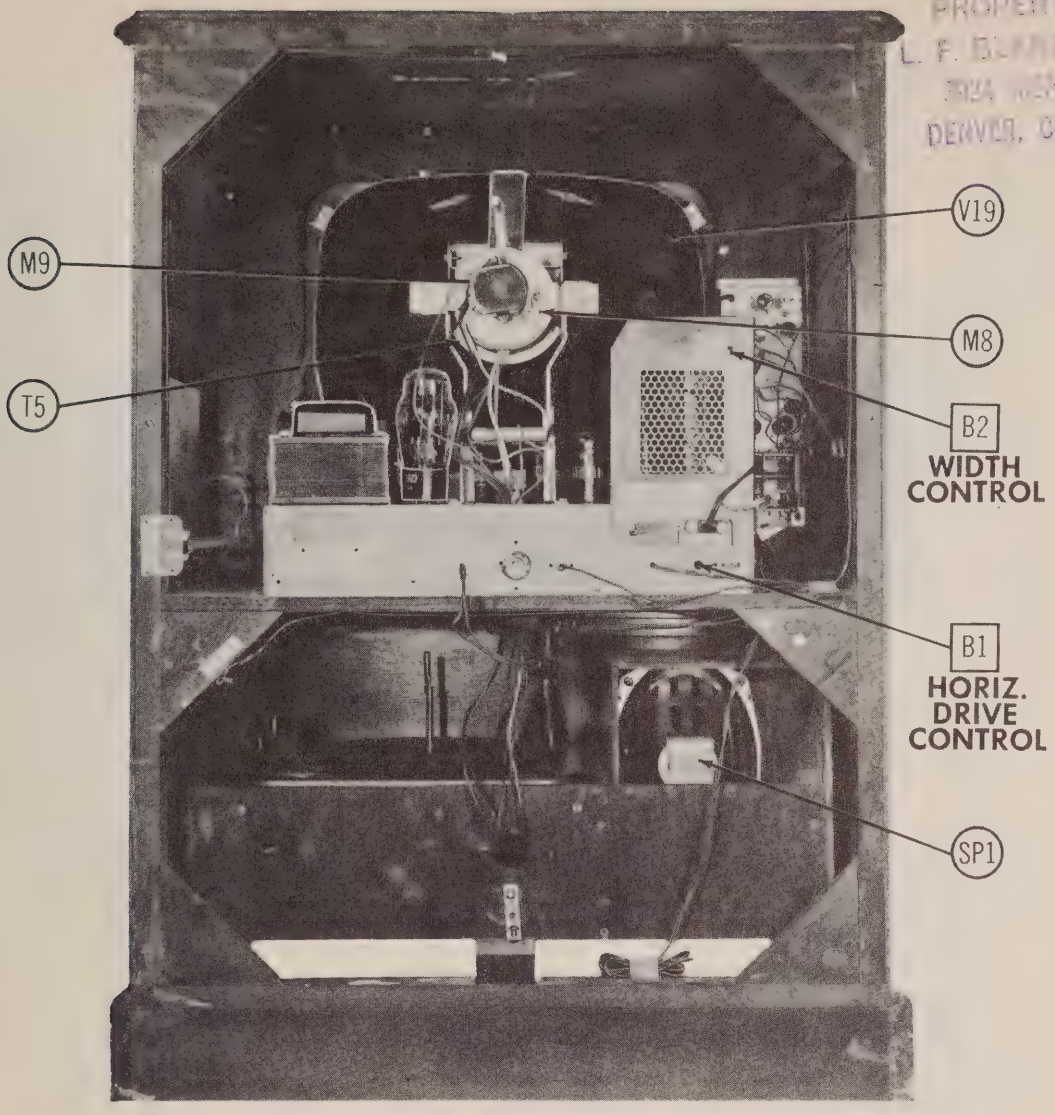


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3124 WEAVER ST.
DENVER, COLORADO



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV Station, preferably a test pattern.

Adjust the horizontal hold adjustment to synchronize the picture horizontally.

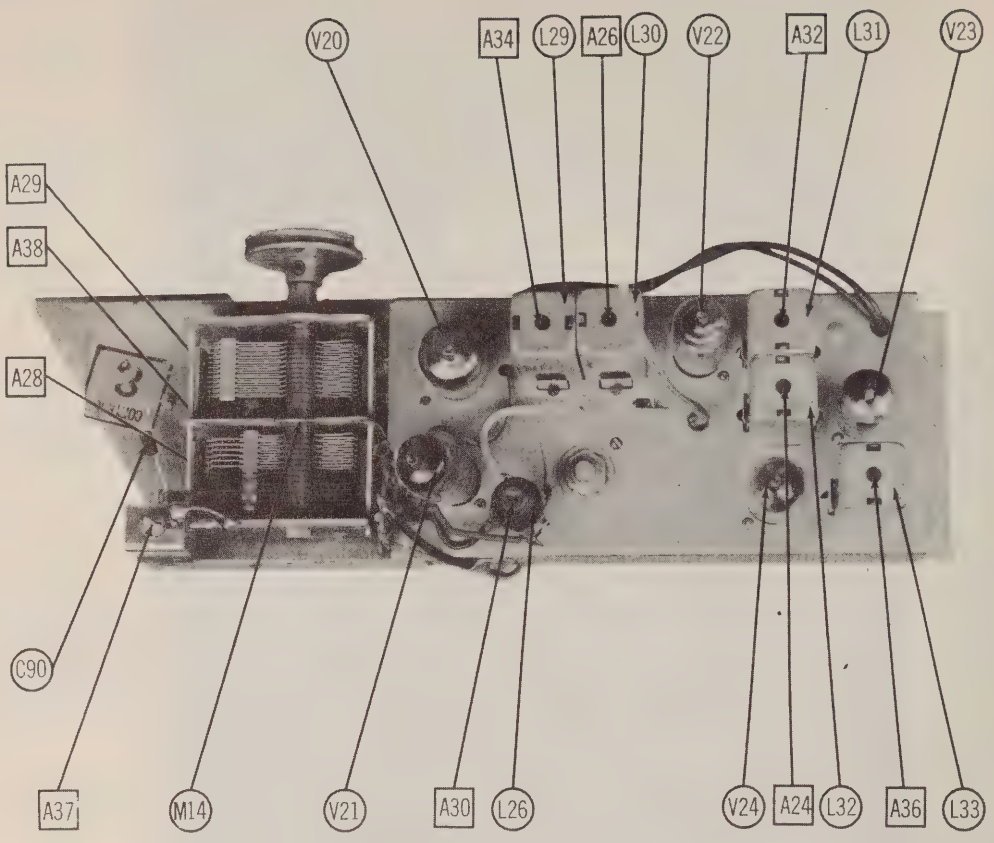
Adjust the horizontal drive trimmer, (B1) for best compromise between brightness and horizontal linearity.

Adjust the width slug, (B2) until the picture is slightly wider than necessary to fill the mask.

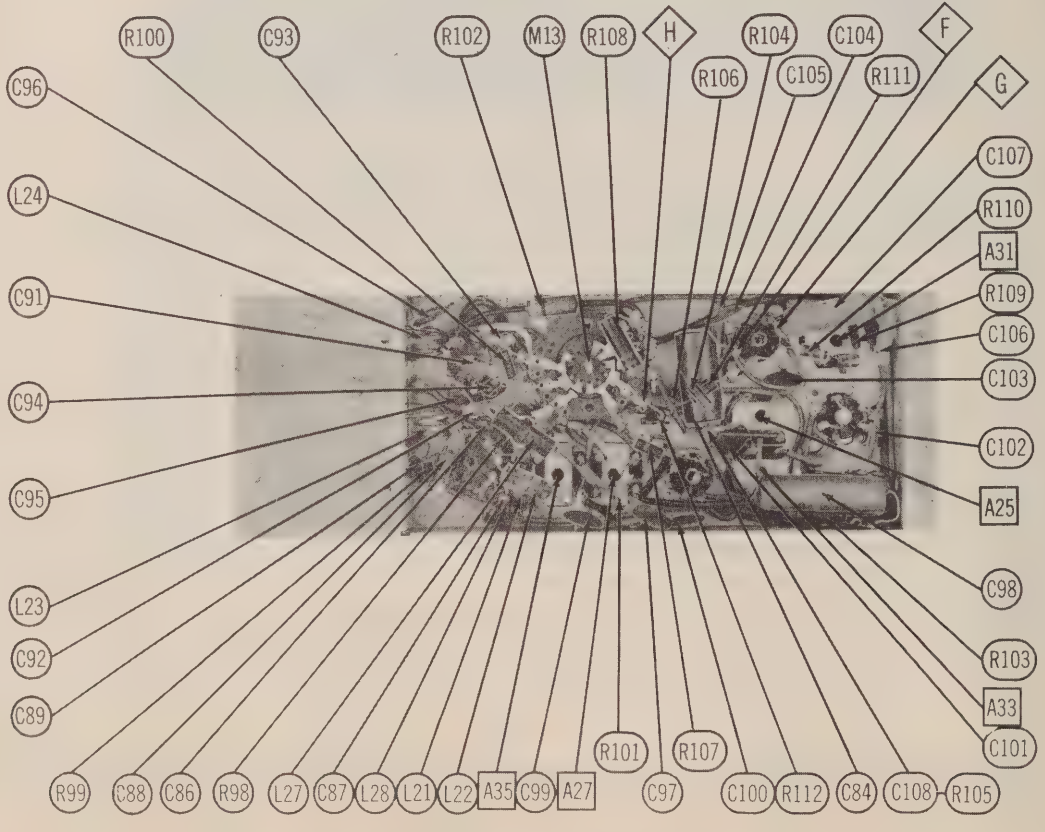
DISASSEMBLY INSTRUCTIONS

1. Remove 8 push-on type Control Knobs from front Panel.
2. Remove 4 wood screws and remove back cover.
3. Disconnect built-in Antenna and remove 2 wood screws holding antenna bracket. Remove bracket.
4. Disconnect Phono motor plug, phono input plug, Radio audio input plug and Radio power plug.
5. Disconnect speaker and AM-FM antenna leads.
6. Remove jewel light from cabinet.
7. Remove 6 chassis bolts. Remove chassis.

Note: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6AG5	6AG5	7BD	
B	RF Amplifier	6BC5	6BC5	7BD	
C	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Output	6AC7	6AC7	8N	
V7	AGC Rectifier Sync. Amplifier	6SN7GT	6SN7GT	8BD	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector AF Amplifier	6T8	6T8	9E	
V10	Audio Output	6AS5	6AS5	7CV	
V11	Sync. Clipper Sync. Phase Inv.	12AU7	12AU7	9A	
V12	Vert. Oscillator Vert. Output	6BL7GT	6BL7GT	8BD	
V13	Horiz. AFC Phase Detector	6AL5	6AL5	6BT	
V14	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rectifier	1X2A	1X2A	9Y	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Stewart Warner PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V19	17BP4A	17BP4A 17BP4 17HP4 ① 17RP4 ②		12D	① Circuit changes necessary - Low voltage focusing circuit required. ② Zero Voltage Electro-static focus tube

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: Stewart Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	509001	AFH3-43		UPT44145		TVL-3785	▲ Filter
B	40	450							■ Filter
C	10	450							▲ Vert. Output Dec.
C2	40	300	160095	PRS450/40		BR4035		TVA-1611	Decoupling
C3A	80	250	509002	AFH3-142		UPT10025		TVL-3722	▲ Decoupling
B	100	50				V15			▲ Vert. Output Cathode Decoupling
C4	10	600	508680	PRS700/10		BRHV610			
C5	4	50		PRS150/4		BR550		TVA-1303	Stabilizing Cap. ¶
C6	4	50		PRS150/4		BR550		TVA-1303	Stabilizing Cap. *
C7	3-9		509064		829-10				Variable Trimmer
C8	.5-3		507698		829-3				Variable Trimmer
C9	120		513439	SI120	D6-121	TM5T12	GP2K-121	5GA-T12	RF Amp. Decoupling
C10	1000		513009	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	RF Amp. Fil. Bypass
C11	100		513440	SI1000	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C12	.5-3		507968		829-3				Variable Trimmer
C13	20		513441	SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C14	10		513442	SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C15	.5-3		509063		829-3				Variable Trimmer
C16A	1000		508576	BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	Conv. Fil. Bypass
B	1000								RF Bypass
C17	10		513444	SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C18	120		512542	SI120	D6-121	TM5T12	GP2K-121	5GA-T12	IF Coupling
C19	1000		513009	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Fil. Bypass
C20	2.2		513001		TCZ-2.2		NP0K-2R2		Neutralizing Cap.
C21	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C22	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Dec.
C23	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Fil.
C24	82		513016	SI82			GP1K-820		IF Coupling
C25	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C26	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Dec.
C27	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Fil.
C28	82		513016	SI82			GP1K-820		IF Coupling
C29	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Dec.
C30	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Cathode
C31	5000		513013	BPD-005	DD-502	TM6D5	811-005	5HK-D5	3rd. Video IF Fil.
C32	.1	200	512033	P288-1	D6-104	PJZP1		2TM-P1	Video Coupling
C33	47		513438	SI47NP0	TCZ-47		NP0K-470	5TCC-Q47	Fixed Trimmer
C34	.1	400	512035	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C35	82		513016	SI82			GP1K-820		IF Coupling
C36	1000		513009	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	AGC Cathode Bypass
C37	.25	200	512045	P488-25		PJ2P25		2TM-P25	AGC Filter
C38	2.2		513001		TCZ-2.2		NP0K-2R2		Sound IF Coupling
C39	47		513002	SI47	D6-470	5R5Q5	GP1K-470	5GA-Q47	Sound IF Coupling
C40	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Grid Dec.
C41	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Dec..
C42	5000		513013	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Cathode
C43	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Diode Load Cap.
C44	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	RF Bypass
C45	1500		513010	SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	De-emphasis
C46	.05	200	512027	P288-05	DF-503	PJ2S5		2TM-S5	Audio Coupling
C47	.005	600	512007	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C48	.005	600	512007	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C49	270		513006	SI270	D6-271	5R5T3	GP2K-271	5GA-T27	AF Amp. Plate Bypass
C50	.01	400	512011	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C51	.01	600	512013	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Tone Comp.
C52	.005	600	512007	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C53	270		513006	SI270	D6-271	5R5T3	GP2K-271	5GA-T27	Sync. Coupling
C54	.01	600	512013	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C55	.05	400	512029	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA Stewart Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C56A	.01			P688-01		PTE631	GP2-333-103		Vert.Sync. Coupling
B	.002		♦ 508062	P688-002	DD-103 †	PTE6D2	GP2-333-202	5HK-S1 ††	Vert. Integrator Net.
C	.005			P688-005	PC-100	PTE6D5	GP2-333-502	10IC1	Vert. Integrator Net.
D	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C57	4700	300	512533	1464-005		UB5E05		MS-25	Vert. Osc. Grid Cap.
C58	.02	600	512019	P688-02	DF-203	PTE632		6TM-S2	Vert. Discharge
C59	.05	600	512308	P688-05	DF-503	PTE635		6TM-S5	Vert. Discharge
C60	.1	600	512027	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C61	.05	200	512027	P288-05	DF-503	PJ2D5		2TM-S5	Fixed Trimmer † †
C62	.02	600	512019	P688-02	DF-203	PTE682		6TM-S2	Vert.Sweep Coupling
C63	.05	600	512031	P688-05	DF-503	PTE635		6TM-S5	Integrator Net.
C64	.001	600	512001	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz.Sync. Coupling
C65	.001	600	512001	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz.Sync. Coupling
C66	.01	200	512009	P488-01	D6-103	PTE6S1	GP2-333-103	4TM-P1	Voltage Divider
C67	.05	600	512031	P688-05	DF-503	PTE685		6TM-S5	Horiz. Feedback
C68	5000		513013	BPD 005	DD-502	TM5D5	811-005	5HK-D5	Horiz. AFC Filter
C69	.05	400	512027	P488-05	DF-503	PTE485		4TM-S5	Horiz. AFC Filter
C70	3900	500	512340	1464-004		UB5D4			Fixed Trimmer
C71	390	500	512535	1469-0004		5R5T4		MS-34	Horiz. MV Feedback
C72	390	500	512535	1469-0004		5R5T4		MS-34	Horiz. Discharge
C73	1000	500	512515	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sweep Coupling
									Horiz. Feedback
C74	5	1500	513026						
C75	.05	600	512031	P688-05	DF-503	PTE685		6TM-S5	Horiz. Output Screen
C76	.25	200	512045	P488-25		PJ2P25		2TM-P25	Horiz. Output Cathode
C77	.25	600	512049	684-25		PTE6P25		6TM-P25	RF Bypass
C78	.01	600	512013	P688-01	D6-103	PTE681	GP2-333-103	6TM-S1	Fixed Trimmer
C79	.25	200	512045	P488-25		PJ2P25		2TM-P25	Horiz.Sweep Coupling
C80	500	20000	508888	HV20C	TV3-502	MM-C20TS			HV Filter
C81	.01	400	512555	489ZGXY-31		PJ4S1		4TM-S1	Line Filter
C82	.01	400	512555	489ZGXY-01		PJ4S1		4TM-S1	Line Filter
C83	.56								Fixed Trimmer

* Not used in all Models
¶ Some Models use 10MFD in this application (Part No. 505174)
† † Some Models use .25MFD in this application (Part No. 512045)
♦ Items C56A, C56B, C56C, C56D, R59A, R59B, R59C are combined in one unit
† Install DD-103 in Series with PC-100 Input Lead to replace MFGR Part No. 508062 Unit
†† Install 5HK-S1 in Series with 10IC1 Input Lead to replace MFGR Part No. 508062 Unit

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stewart Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	9158-2	Q13-137X	AK-98-Z		Volume Control-Tapped@250KΩ - See Note
B	Shaft		Not Req.	RQ	FKS-1/4		Attach to R1A per instructions
C	Switch		Not Req.	T8-1	SWB		Attach to R1A per instructions
R2A	50KΩ	½	508e89	Q11-123	AG-44-S	AN-31	Brightness Control
B	Shaft		Not Req.	RS-2	AK-4	AN-10	Attach to R2A per instructions
			Concentrikit@				
R3A	2.5Meg	½	508893	B11-339 *	RTV-313		Height Control - Panel
B	1Meg	½		B11-137 *			Vert. Hold Control - Rear
C	Shaft end			K187 *			Attach per Instructions in " Concentrikit".
R4A	5000Ω	½	508891	Q11-114	AM-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not Req.	RS-2	AK-4		Attach to R4A per instructions
R5A	750Ω	2	509763				Contrast Control - Wire Wound - Panel
B	500KΩ	½					Tone Control - Rear

Note. Some Models use alternate volume control (Part #508182)
* Additional Parts to be used with Concentrikit.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stewart Warner PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R6	390Ω	½	510147	BTS-3900	Antenna Coil Shunt
R7	36KΩ	½	510187		AGC Network - See Note 2
R8	2200Ω	½	510143	BTS-2200	RF Amp. Decoupling
R9	10KΩ	½	510155	BTS-10K	RF Coil Shunt
R10	4700Ω	½	510149	BTS-4700	Mixer Grid
R11	220KΩ 20%	½	510179	BTS-	Mixer Grid
R12	15KΩ 20%	½	510158		Mixer Plate
R13	10KΩ	½	510155	BTS-10K	Osc. Grid
R14	4700Ω	½	510149	BTS-4700	Osc. Plate
R15	8200Ω	½	510756		1st. Video IF Amp. Grid
R16	47Ω	½	510112		1st. Video IF Amp. Cathode
R17	390Ω	½	510129	BTS-390	AGC Network
R18	8200Ω	½	510756		2nd. Video IF Amp. Grid
R19	82Ω	½	510117	BTS-82	2nd. Video IF Amp. Cathode
R20	100Ω 20%	½	510119	BTS-100	Decoupling
R21	100Ω 20%	½	510119	BTS-100	Decoupling
R22	100Ω 20%	½	510119	BTS-100	Decoupling
R23	12KΩ 5%	½	510723		3rd. Video IF Coil Shunt
R24	100Ω	½	510118	BTS-100	3rd. Video IF Amp. Cathode
R25	560KΩ	½	510186	BTS-560K	AGC Network
R26	47KΩ	½	510166	BTS-47K	AGC Network
R27	1Meg	½	510191	BTS-1Meg	Video Output Grid
R28	18KΩ 5%	½	510745	BTS-18K 5%	Video Peaking
R29	4000Ω	5	510753	13/4A-4000	Video Output Plate - Wire Wound
R30	10KΩ	½	510154	BTS-10K	Isolation
R31	470KΩ	½	510184	BTS-470K	Voltage Divider
R32	470KΩ	½	510184	BTS-470K	Picture Tube Cathode
R33	22KΩ	½	510160	BTS-22K	Picture Tube Grid
R34	2200Ω	½	510142	BTS-2200	Vert. Blanking Network
R35	15KΩ	½	510157	BTS-15K	Voltage Divider
R36	18KΩ	½	510159		Sound IF Coil Shunt
R37	470KΩ	½	510184		Sound IF Amp. Grid
R38	82Ω	½	510117	BTS-82	Sound IF Amp. Cathode
R39	680Ω	½	510134	BTS-680	Decoupling
R40	4700Ω 20%	½	510249	BTA-4700	Sound IF Amp. Decoupling
R41	220Ω 20%	½	510124	BTS-220	Balancing
R42	220Ω 20%	½	510124	BTS-220	Balancing
R43	18KΩ	½	510159	BTS-18K	De-emphasis

RESISTORS (CONT.)

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stewart Warner PART No.	IRC PART No.	IDENTIFICATION CODES
R44	68KΩ	½	510170	BTS-68K	Tone Compensation
R45	22KΩ	½	510160	BTS-22K	Ratio Det. Diode Load
R46	10Meg 20%	½	510197	BTS-10Meg	AF Amp. Grid
R47	470KΩ	½	510184	BTS-470K	AF Amp. Plate
R48	820KΩ 5%	½	510747	BTS-820K 5%	Voltage Divider
R49	680KΩ 5%	½	510748	BTS-680K 5%	Output Grid
R50	270KΩ	½	510180	BTS-270K	Isolation
R51	2.2Meg 20%	½	510193	BTS-2.2Meg	Sync. Amp. Grid
R52	68KΩ	½	510169	BTS-68K	Sync. Amp. Plate
R53	270KΩ	½	510180	BTS-270K	Sync. Clipper Cathode
R54	680KΩ	½	510187	BTS-680K	Sync. Clipper Plate
R55	3900Ω 5%	½	510748	BTS-3900	Sync. Phase Inv. Cathode
R56	6800Ω	½	510151	BTS-6800	Sync. Phase Inv. Plate
R57	4700Ω 5%	½	510750	BTS-4700 5%	Sync. Phase Inv. Plate
R58	27KΩ	½	510163	BTS-27K	Integrator Network
R59A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	508062 ♦	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R60	1.5Meg	½	510752	BTS-1.5Meg	Vert. Osc. Grid - See Note 1
R61	1.5Meg	½	510752	BTS-1.5Meg	Vert. Osc. Plate
R62	100KΩ	½	510173	BTS-100K	Voltage Divider
R63	4.7Meg	½	510759	BTS-4.7Meg	Voltage Divider
R64	6800Ω	½	510151	BTS-6800	Vert. Peaking
R65	2.2Meg 20%	½	510193	BTS-2.2Meg	Vert. Output Grid
R66	680Ω	½	510134	BTS-680	Vert. Output Cathode
R67	2700Ω	2	510344	BTB-2700	Decoupling
R68	560Ω	½	510133	BTS-560	Damping
R69	560Ω	½	510133	BTS-560	Damping
R70	100KΩ 5%	½	510751	BTS-100K 5%	Horiz.Phase Det. Diode Load
R71	100KΩ 5%	½	510751	BTS-100K 5%	Horiz.Phase Det. Diode Load
R72	4.7Meg	½	510195	BTS-4.7Meg	Horiz.Phase Det. Diode Load
R73	470KΩ	½	510184	BTS-470K	Horiz. AFC Filter
R74	27KΩ	½	510163	BTS-27K	Horiz. Feedback
R75	4700Ω	1	510248	BTA-4700	Horiz. Feedback
R76	3300Ω	½	510145	BTS-3300	Horiz. MV Plate
R77	1500Ω	½	510139	BTS-1500	Horiz. MV Cathode
R78	100KΩ	½	510172	BTS-100K	Horiz. MV Grid
R79	680KΩ	½	510187	BTS-680K	Horiz. MV Plate
R80	270KΩ	½	510180	BTS-270K	Voltage Divider
R81	15KΩ	2	510357	BTB-15K	Decoupling
R82	68Ω	½	510116		Parasitic Suppressor
R83	470KΩ	½	510184	BTS-470K	Horiz.Output Grid
R84	100Ω	1	510218	BW-1-100	Horiz. Output Cathode
R85	12KΩ	½	510758	13/4A-12K	Horiz. Output Screen - Wire Wound
R86	1000Ω 20%	½	510137	BTS-1000	Damping
R87	1Meg	2	510390		HV Filter
R88	2000Ω	5	510760	13/4A-300	Filter - Wire Wound
R89	2500Ω	5	510761	13/4A-2500	Filter - Wire Wound
R90	3700	10	510762	13/4A-3500	Filter - Wire Wound
R91	6000Ω	10	510741	13/4A-600	Filter - Wire Wound
R92	2000Ω	20	510764	2D-2000	Voltage Divider - Wire Wound
R93	5000Ω	10	510763	13/4A-5000	Bleeder - Wire Wound
R94	3.3Ω	½	510725		Series Pilot Light
R95	3.3Ω	½	510725		Series Pilot Light
R96	220KΩ	½	510179	BTS-220K	Line Isolation
R97	500KΩ	½			Isolation - See Note 3

Note 1. Some Models use a 2Meg Resistor in this application.
♦ Items R59A, R59B, R59C, C56A, C56B, C56C are combined in one unit.
Note 2. Some Models use a 47KΩ Resistor in this application.
Note 3. Not used in all Models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Stewart Warner PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	640VCT	5VAC	6.3VAC	509380	P-6315	P-3067 ②	TP-370 ③
	④1.0A	.210ADC	③3A	④7.4A		P-6134 ①		
				SEC. 4				
				6.3VAC				
				④1.2A				

① Mount beneath Chassis and use for Sec. #4.
② Add Series Resistor to Reduce Plate Voltage

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA Stewart Warner PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	153Ω	940Ω	508076	A-8111 ①	A-3000 ③	T80-1 ④	Vert. Oscillator Trans.
T3	295Ω	3.7Ω	509384		HV0-7		Hor. Output Trans.
	Tapped @35Ω	Tapped ③.4Ω & 3Ω			MWC-1 ⑤		
		SEC. 3					
		0Ω					
T4	800Ω Tapped @9Ω		509375	A-8123 ③	A-3037	T80-5	Vert. Output Trans.
T5A	16Ω		509704	DY-8	MDF-70		Hor. Deflection Coils
B	48Ω						Vert. Deflection Coils

① Drill One New Mounting Hole
④ Mount on top of Chassis
⑤ Replace Width Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No	RATING IMPEDANCE PRI	RATING IMPEDANCE SEC	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA Stewart Warner PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	5KΩ	3.5Ω	450Ω	.9Ω	509376	A-3077 ②	A-2930	RO-8 ②	② Drill One New Mounting Hole

SPEAKER

ITEM No	RATINGS		REPLACEMENT DATA Stewart Warner PART No	JENSEN PART No	QUAM PART No	NOTES
SP1A	FIELD RES.	V. C. IMP.	508174	ST-810 Mod. P69-V	69A2	
	P.M.	3.5Ω				
	CONE DIA.	V. C. DIA.				
SP1B	6" X 9"	9 16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 MA	REPLACEMENT DATA Stewart Warner PART No.	REPLACEMENT DATA STANCOR PART No	REPLACEMENT DATA MERIT PART No	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.210A DC	73Ω	2.9 Henries	508341	C-2325	C-2991 ①	TR-3300 ①	① Drill One New Mounting Hole

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Stewart Warner PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L2	Ant. Coil	0Ω		507952		Channel #2
L3	Fil. Choke	0Ω		507970		
L4	RF, Mixer Grid & Osc. Coils	0Ω		507972		Channel #2
L5	Fil. Choke	0Ω		507971		
L6	1st. Video IF	.6Ω		509061		Includes Slug Part #509062
L7	Fil. Choke	0Ω		507584		
L8	Fil. Choke	0Ω		507584		
L9	2nd. Video IF	.1Ω		507343	TV-112	Less Slug Part #507357
L10	Fil. Choke	0Ω		507584		
L11	RF Choke	2.4Ω		507367		
L12	3rd. Video IF	1Ω		507343	TV-112	Less Slug Part #507357
L13	Fil. Choke	0Ω		507584		
L14	4.5MC Trap	1.8Ω		509603		Includes Slug Part #507357
L15	Peaking Coil	9.8Ω		509341	TV-185	
L16	Peaking Coil	13.8Ω		509342	TV-188	
L17	Sound IF	1.5Ω		509378		
L18	Ratio Det.	3.8Ω	.7Ω	509706		Tap④ .9Ω
L19	Horiz. Osc.	75Ω		508907		Includes Slug Part #508963
L20	Width Coil	1.4Ω		509361	MWC-2	Includes Slug Part #507429

FUSES

ITEM No	TYPE	RATING	REPLACEMENT DATA Stewart Warner PART No. FUSE	Stewart Warner PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
M1	3AG Pigtail	1A. 250V.	509517		318001		GJV-1	
M2	3AG Pigtail	1/4A. 250V.	508063		318.250		GJV-1/4	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA Stewart Warner PART No.	NOTES
M3	Bayonet	6-8	.15	Brown	118921	Type #47
M4	Bayonet	6-8	.15	Brown	118921	Type #47

MISCELLANEOUS

ITEM No.	PART NAME	Stewart Warner PART No.	NOTES
M5	RF Tuner	508890	Complete with Tubes
	4th. Video IF	507357	Less Slug
M6	Capacitor	513068	82MMF
	RF Choke	507367	
	Crystal	509388	1N64
M6	Capacitor	513433	5MMF
	Peaking	509340	Coil
	Peaking	509343	Coil
	Resistor	510153	8.2KΩ
M7	Switch	509762	Function(Includes Vol. Control & Off/On Switch)
M8	Focus Magnet	509644	
M9	3rd Trap	509668	
B1	Trimmer	508071	Horiz. Drive (60-160MMF)
	Knob	509101	Channel Selector
	Knob	508309	Contrast
	Knob	509107	Tone
	Knob	509109	Fine Tuning
	Knob	508308	TV Phono - AM-FM
	Knob	509108	Off/On Volume

STEWART WARNER
MODEL 9203-A

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		Stewart Warner PART No.	STANDARD REPLACEMENT		
V20	FM RF Amplifier FM Mixer	12AT7	12AT7	9A	
V21	FM Oscillator AM Converter	6BE6	6BE6	7CH	
V22	lst. FM AM IF Amp.	6BA6	6BA6	7BK	
V23	2nd. FM IF Amp. – AM Detector-AVC	6BA6	6BA6	7BK	
V24	Ratio Detector FM AVC	6AL5	6AL5	6BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Stewart Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C84	3	50	507946	PRS150/4		BBR3-50		TVA-1303	Stabilizing Cap.
C85	10		513023	SII0	D6-100		GP1K-100	5GA-Q1	FM RF Coupling
C86	1000		513009	SII000	D6-102	TM5D1	GP2L-102	5HK-D1	FM RF Amp. Grid Filter
C87	1000		513009	SII000	D6-102	TM5D1	GP2L-102	5HK-D1	FM RF Amp. Fil. Bypass
C88	330		513007	SI330	D6-331		GP2K-331	5GA-T33	FM RF Coupling
C89	1000		513009	SII000	D6-102	TM5D1	GP2L-102	5HK-D1	FM RF Coupling
C90	1		513000		TCZ-1		NP0K-010		FM Osc. Coupling
C91	47		513002	SI47	D6-470	5R5Q5	GP1K-470	5GA-Q47	FM Osc. Grid Cap.
C92	2.5		513436						FM Osc. Feedback
C93	47		513002	SI47	D6-470	5R5Q5	GP1K-470	5GA-Q47	Osc. Grid Cap.
C94	2.2		513001		TCZ-2.2		NP0K-2R2		Osc. Feedback
C95	1000		513009	SII000	D6-102	TM5D1	GP2L-102	5HK-D1	AM Conv. Fil. Bypass
C96	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	AM Conv. Dec.
C97	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	AVC Filter
C98	.05	400	512028	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C99	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	Decoupling
C100	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	lst. IF Amp. Dec.
C101	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	lst. IF Amp. Fil.
C102	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	2nd. FM IF Amp. Dec.
C103	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	2nd. FM IF Amp. Fil.
C104	5000		513013	BPD-005	DD-502	TM5D5	B11-005	5HK-D5	Ratio Det. Fil.
C105	330		513007	SI330	D6-331		GP1K-331	5GA-T33	Diode Load Cap.
C106	330		513007	SI330	D6-331		GP1K-331	5GA-T33	RF Bypass
C107	.001	400	512103	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-emphasis
C108A	100		* *506338	SII00	**PC-50	TM5T1	GP1K-101	**100C1	Diode RF Filter
B	100			SII00		TM5T1	GP1K-101		Diode RF Filter

** Items C108A, C108B. R105 are combined in one unit

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Stewart Warner PART No.	IRC PART No.	
R98	100KΩ	1/2	510173	BTS-100K	FM RF Amp. Grid
R99	2.2Meg	1/2	510193		FM Mixer Grid
R100	10KΩ	1/2	510155	BTS-10K	FM Osc. Grid
R101	6800Ω	1/2	510152	BTS-6800	Decoupling
R102	4700Ω	1	510249	BTA-4700	Decoupling
R103	3300Ω	1/2	510146	BTS-3300	Decoupling
R104	3300Ω	1	510246	BTA-3300	Decoupling
R105	47KΩ	1/2	506338 *	BTS-47K	Diode Filter
R106	470KΩ	1/2	510185	BTS-470K	Diode Load
R107	2.2Meg	1/2	510193	BTS-2.2Meg	AVC Network
R108	1500Ω	1	510240	BTA-1500	2nd. FM IF Amp. Decoupling
R109	220Ω	1/2	510125	BTS-220	Balancing
R110	18KΩ	1/2	510159	BTS-18K	De-emphasis
R111	10KΩ	1/2	510155	BTS-10K	Ratio Det. Diode Load
R112	10KΩ	1/2	510155	BTS-10K	Ratio Det. Diode Load

* Items R105, C108A, C108B are combined in one unit

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Stewart Warner PART No.	MERIT PART No.	IRC PART No.	
L21	Cath. Choke	.8Ω		507586		CLA	1 Microhenry
L22	RF Choke	3Ω		507935		CLA	3.3 Microhenries
L23	FM RF Coil	0Ω		507941			
L24	FM Osc. Coil	0Ω		507942			
L25	AM Loop Ant.	.2Ω		508212			
L26	AM Ant. Coil	.3Ω	2.4Ω	508184			
L27	AM Osc. Coil	7.5Ω		508195	BC-400		Tap @ .7Ω
L28	Parasitic Suppressor	0Ω		506581			Wound on 1KΩ Resistor
L29	lst. FM IF	.5Ω	.5Ω	506080	FM-254		
L30	lst. AM IF	21Ω	21Ω	505867	BC-352		
L31	2nd. FM IF	1.6Ω	.5Ω	505905	FM-254		
L32	2nd. AM IF	21Ω	21Ω	505867	BC-353		
L33	Ratio Det.	1.6Ω	.6Ω	508179	FM-255		Tap @ .8Ω

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA						REMARKS
	Stewart Warner PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M10.	509160	GC-AG-J	G-AG			43	0-2 or S-2	

ASTATIC AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED: FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Stewart Warner PART No.	WALCO PART No.	JENSEN PART No.	
M11	509161	W-3AGS or W-3AGA	S-652	

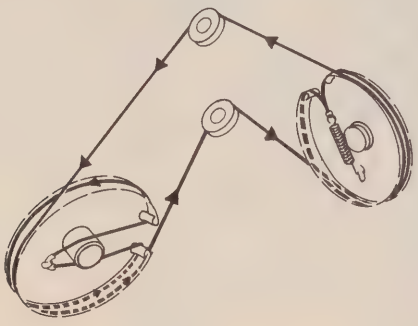
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Stewart Warner PART No.		
M12	Bayonet	6-8	.15	Brown	118921		Type #47

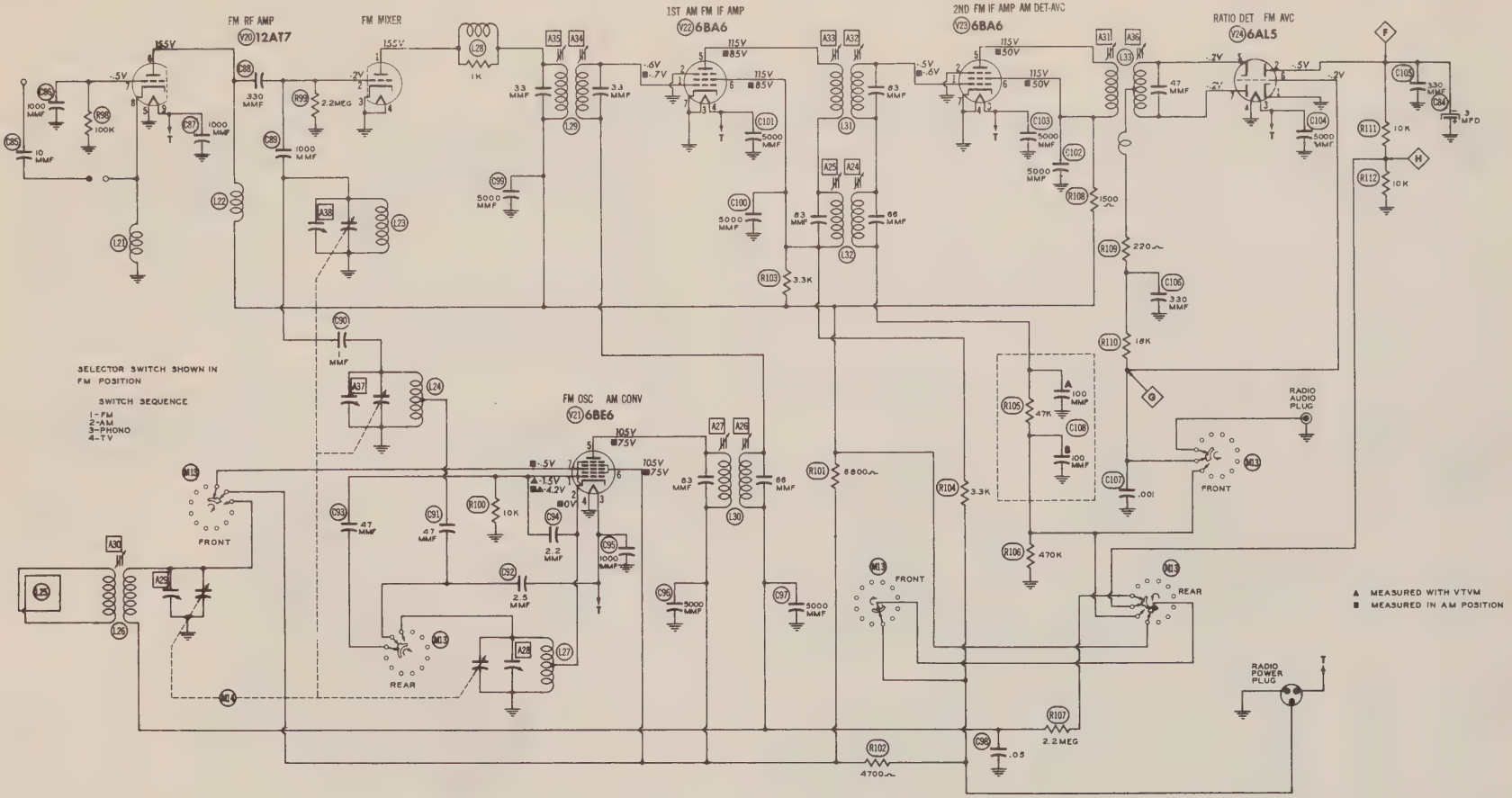
MISCELLANEOUS

ITEM No.	PART NAME	Stewart Warner PART No.	NOTES
M13	Switch	508753	Band AM-FM-Phono (On AM-FM Chassis)
M14	Tuning Cap	508729	(26-560MMF - 29-212MMF)
	Trimmer	507940	FM Osc. 1.5 - 12MMF
	Knob	509111	AM-FM Coarse Tuning
	Knob	509102	AM-FM Fine Tuning

TUNING GANG FULLY CLOSED



DIAL CORD STRINGING



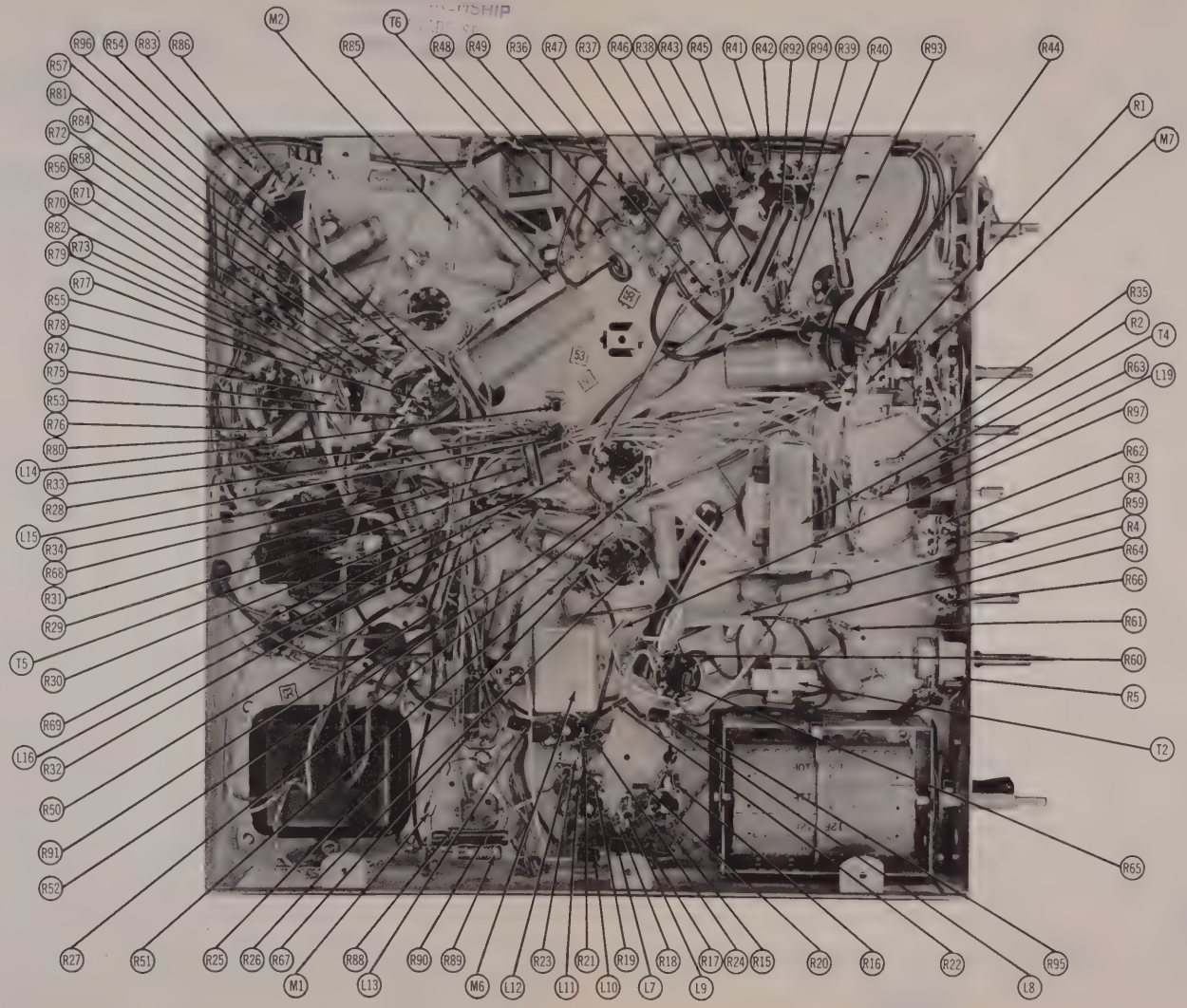
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V20	12AT7	†2,4KΩ	2.2Meg	0Ω	0Ω	0Ω	†2.4KΩ	100KΩ	.8Ω	.1Ω
V21	6BE6	10KΩ	.8Ω	.1Ω	0Ω	†6.8KΩ ■¶4.7KΩ	†6.8KΩ ■¶4.7KΩ	2.7Meg		
V22	6BA6	2.2Meg ■2.7Meg	0Ω	0Ω	.1Ω	†4.4KΩ ■¶3.3KΩ	†4.4KΩ ■¶3.3KΩ	0Ω		
V23	6BA6	515KΩ	0Ω	.1Ω	0Ω	†4KΩ ■¶6.3KΩ	†4KΩ ■¶6.3KΩ	0Ω		
V24	6AL5	0Ω	20KΩ	.1Ω	0Ω	INF	INF	INF		

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS NOTED
† MEASURED FROM PIN 8 OF V18
■ MEASURED IN AM POSITION
¶ MEASURED FROM PIN 1 OF V10

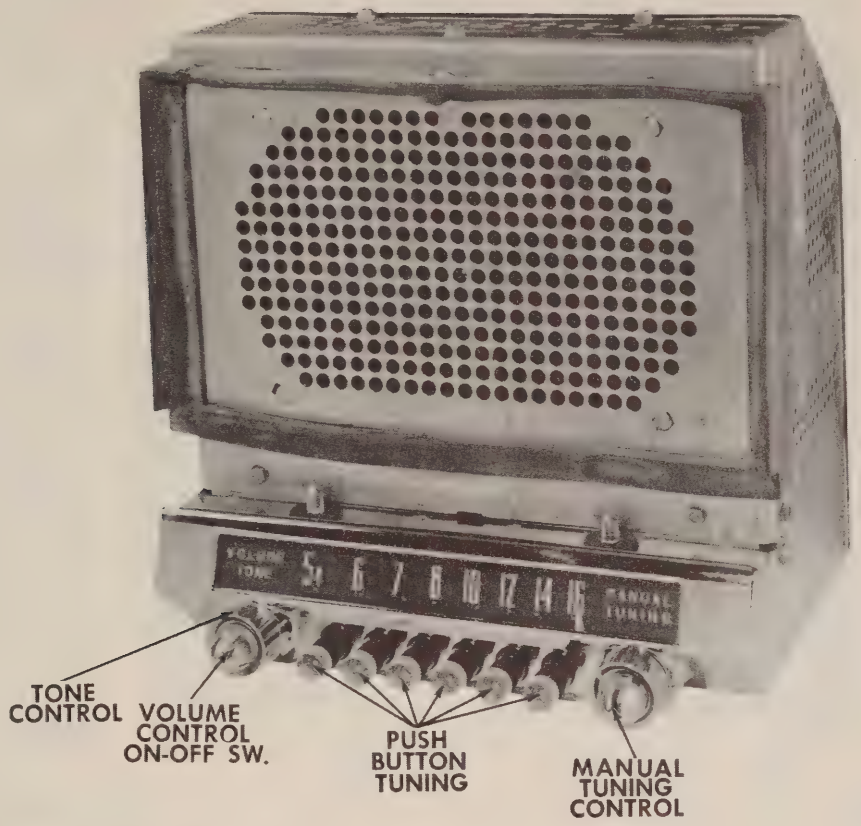
STEWART WARNER
MODEL 9203-A

RADIO SCHEMATIC



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



STUDEBAKER
MODEL AC2111

TRADE NAME	Studebaker Model AC2111
SUPPLIER	Studebaker Corp., South Bend, Indiana
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (EIGHT)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6C4 Phase Inv., (2) 6AQ5 Audio Output, 6 X 4 Rectifier.
POWER SUPPLY	6 Volt Storage Battery — RATING 9.4 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to Pin 7, (grid, of 6BE6, (V2). Low side to chassis.	265KC (400∿ Mod.	Low freq. end	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output
2.	Two 40MMF capacitors	High side thru 40MMF to ant. receptacle. (connect 40MMF between ant. connector & chassis.) Low side to chassis.	1605KC	High freq. end	"	A5, A6, A7	Adjust in order given for max. output.
3.	"	"	1400KC	1400KC	"	A8, A9, A10	Adjust for maximum output. Repeat steps 2 & 3 until no further improvement can be made.
4.	"	"	600KC	600KC	"	A11	Rock tuning gang while adjusting A11 for maximum output. Recheck A5 at 1605KC. If necessary repeat adjustment of A5 & A11 until no further improvement can be made.

AFTER SET IS INSTALLED FULLY EXTEND THE ANTENNA AND TUNE IN A WEAK STATION NEAR 1400KC. RETOUCH A7 FOR MAXIMUM OUTPUT.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		STUDEBAKER PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Phase Inverter	6C4	6C4	6BG	
V6	Audio Output	6AQ5	6AQ5	7BD	
V7	Audio Output	6AQ5	6AQ5	7BD	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

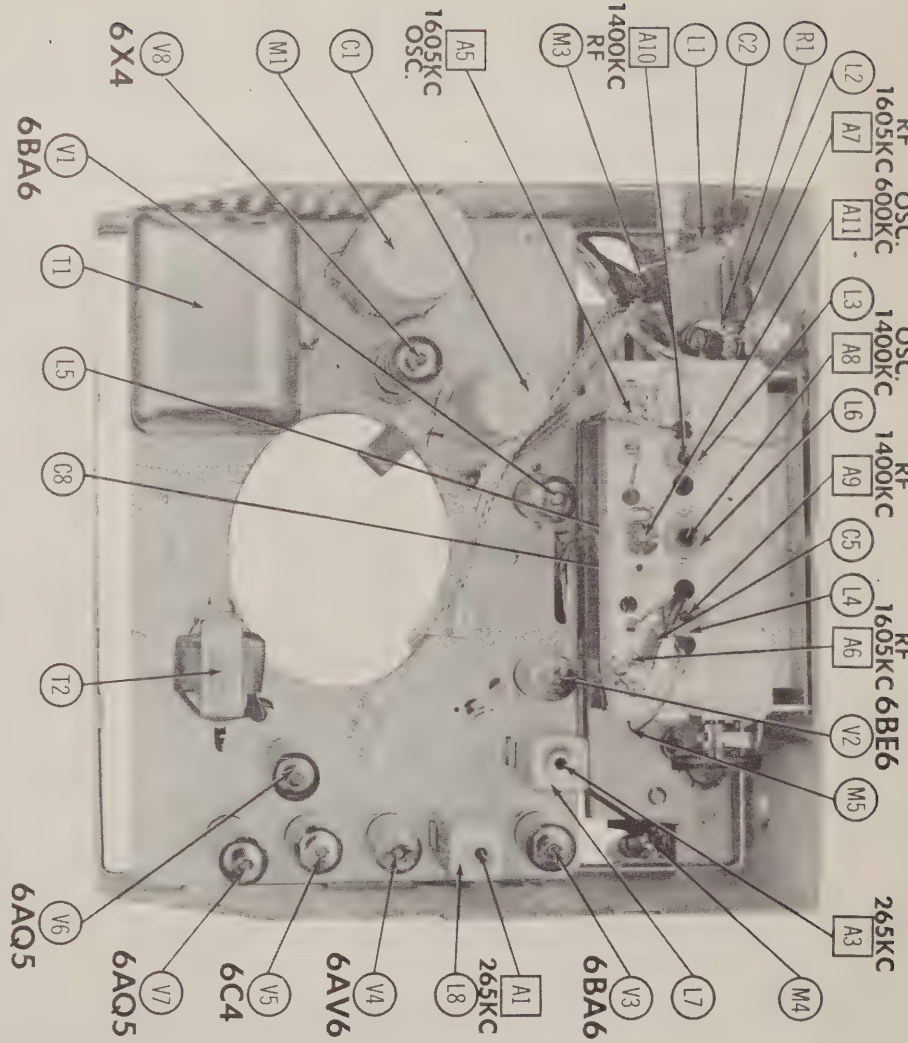
ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	STUDEBAKER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	350	61-0086A	AFH3-106		UP2135C		TVL-3634	■ Filter
B	10	350							▲ Filter
C	20	25							Audio Output Cathode
C2	10	500	62-010409001	1468-00001	D6-100	5W5Q1	GP1K-100	1FM-41	Ant. Filter
C3	.047	200	45-3505-28	P288-047	DF-503	PJ2S5		2TM-S47	AVC Filter
C4	180	500	60-10185417	SI180	D6-181	5R5T2	GP2K-181	MS-32	RF Coupling
C5	100		62-110009001	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Fixed Padder
C6	100	500	62-110009001	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Osc. Grid Cap.
C7	215	500	30-1220-4						Fixed Trimmer
C8	54.5		61-0149						Fixed Trimmer
C9	.047	200	45-3505-28	P288-047	DF-503	PJ2S5		2TM-S47	Osc. Anode Bypass
C10	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Audio Coupling
C11	220		62-122001001	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Plate Bypass
C12	.0047	400	45-3505-56	P688-0047	D6-472	PTED47	GP2-333-472	6TM-D47	Audio Coupling
C13	.01	400	45-3505-41	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C14	.01	400	45-3505-41	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C15	.0068	1000	45-3505-91	P1088-0068		PTE16D68		MB-D68	Audio Output Plate
C16	.01	400	45-3505-41	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C17	.25	120	61-0125	P488-25		PJ2P25		2TM-P25	Tone Comp.
C18	.1	200	45-3505-30	P288-1	DF-104	PJ2P1		2TM-P1	Tone Comp.
C19	.0068	1600	30-4661-8	P1688-0068		PTE16D68		MB-D68	Buffer Cap.
C20	330		62-133001001	SI330	D6-331		GP2K-331	5GA-T33	RF Bypass
C21	.5	120	61-0137	P488-5		PJ2P5		2TM-P25	Hash Filter
C22	330	500	62-133001001	SI330	D6-331		GP2K-331	5GA-T33	RF Bypass
C23	.5	120	61-0137	P488-5		PJ2P5		2TM-P25	Hash Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	STUDEBAKER PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO.	
R1A	350KΩ	½	33-555-7	Concentrikit			Volume Control - Panel
B	4Meg	½		B13-132*			Tone Control & Sw.-Rear -See Note
C	Shaft End			B12-141*			Attach per instructions in "Concentrikit"
D	Switch			E187*			Attach per instructions in "Concentrikit"
				76-1*			

Note. Tone Control is open at center, 2Meg each side of center
* Additional Parts to be used with "Concentrikit"

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	STUDEBAKER PART No.	IRC PART No.	
R2	560Ω	½	66-1568340	BTS-560	RF Amp. Cathode
R3	68KΩ	½	66-3688340	BTS-68K	AVC Network
R4	10KΩ	½	66-3108340	BTS-10K	RF Amp. Plate
R5	22KΩ	½	66-3228340		Osc. Grid
R6	1Meg	½	66-5108340	BTS-1Meg	AVC Network
R7	27KΩ	1	66-3278340		Screen Dropping
R8	820Ω	½		BTS-820	IF Amp. Cathode - See Note 1
R9	22KΩ	½	66-3228340	BTS-22K	Diode Filter
R10	15Meg	½	66-6158340	BTS-15Meg	AF Amp. Grid
R11	220KΩ	½	66-4228340	BTS-220K	AF Amp. Plate
R12	180Ω	½	66-1188340	BTS-180	Tone Compensation
R13	2200Ω	½	66-2228340	BTS-2200	Feedback Network
R14	15Meg	½	66-6158340	BTS-15Meg	Phase Inv. Grid
R15	220KΩ	½	66-4228340	BTS-220K	Phase Inv. Cathode
R16	220KΩ	½	66-4228340	BTS-220	Phase Inv. Plate
R17	470KΩ	½	66-4478340	BTS-470K	Output Grid
R18	470KΩ	½	66-4478340	BTS-470K	Output Grid
R19	330Ω	1	66-1334340	BTA-330	Output Cathode
R20	100Ω	1	66-1104340	BTA-100	Noise Suppressor
R21	100Ω	1	66-1104340	BTA-100	Noise Suppressor
R22	1000Ω	1	66-2104340	BTA-1000	Filter

Note 1. Some Models use a 1000Ω Resistor in this application

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	STUDEBAKER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC @4.4A	520VCT .077ADC			32-8313-1		P-3068	VT-4

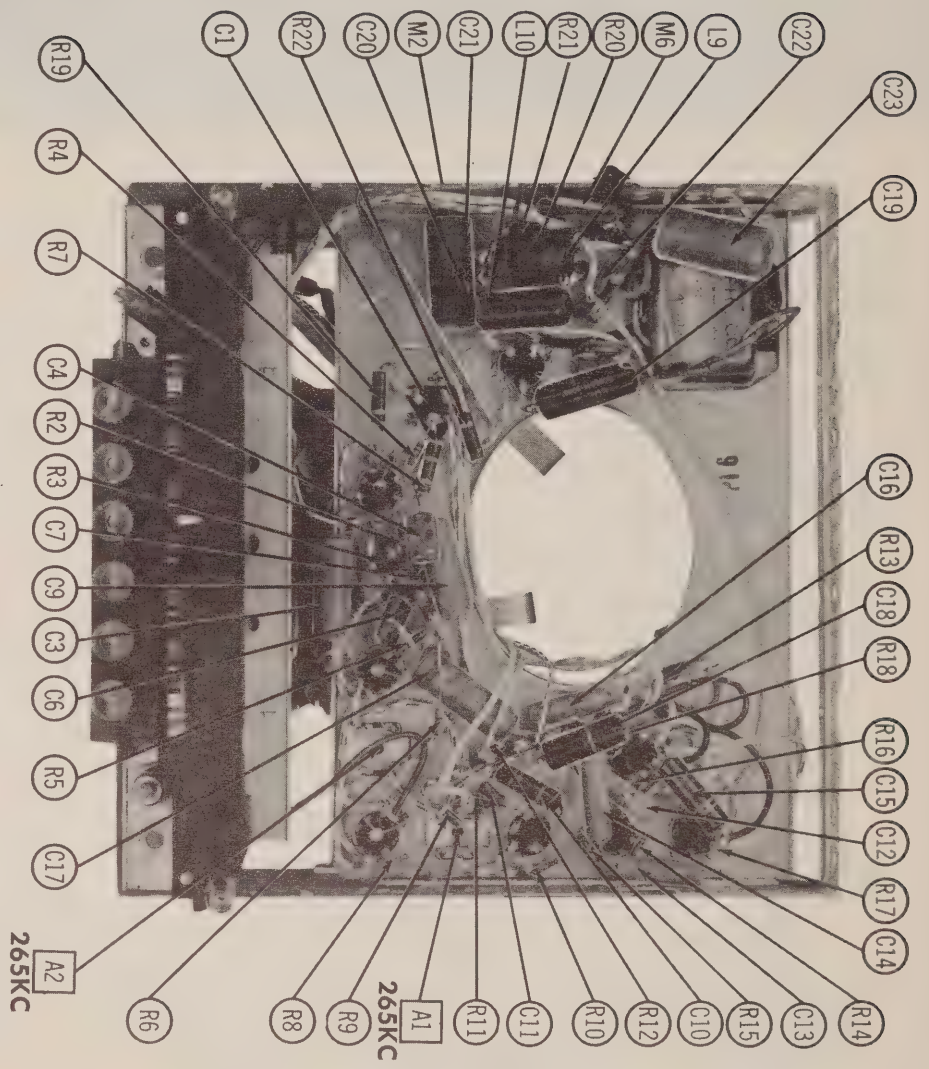
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		STUDEBAKER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	3.7KΩ CT	3.2Ω	485Ω CT	.3Ω	32-8316		A-2900 ①		① Drill one new Mounting Hole

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	STUDEBAKER PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	4Ω	3.2Ω	36-1642-2 36-1631 ②	ST-813 Mod. F69-U	69EV6	② Alternate Speaker
	CONE DIA.	V. C. DIA.				
SP1B	6" X 9"	3/4"				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA STUDEBAKER PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA IRC PART No.	NOTES
L1	Ant. Choke	4Ω		32-4422-24		CL-1	5.6 Microhenries
L2	Ant Choke	.7Ω		65-0378			
L3	Ant. Coil	11Ω		65-0334-22			
L4	RF Coil	10.2Ω		65-0334-23			Tap ⓐ 1.4Ω
L5	Osc. Coil						
	Shunt	3Ω		32-4395-2			Tap ⓐ .8Ω
L6	Osc. Coil	2.9Ω		65-0443-24			
L7	Input IF	44Ω	48Ω	32-4290-1A			
L8	Output IF	49Ω	44Ω	32-4293-1A			
L9	Hash Choke	0Ω		32-1374-2			
L10	Hash Choke	0Ω		32-4170-4			

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA STUDEBAKER PART No.	REPLACEMENT DATA CORNELL-DUBILIER PART No.	REPLACEMENT DATA RADIART PART No.	INSTALLATION NOTES
M1	Interrupter	6.3	115∿	83-0035 83-0026 ③	5326	5326	③ Alternate Vibrator

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA STUDEBAKER PART No. FUSE	STUDEBAKER PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	SFE	14A.	45-2559	56-3807-4	307014	155014	SFE-14	HRI

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA STUDEBAKER PART No.		NOTES
M3	Bayonet	6-8	.15	Brown	34-2068		Type No. #47
M4	Bayonet	6-8	.15	Brown	34-2068		Type No. #47

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	STUDEBAKER PART No.	NOTES
M5	Tuner Unit	76-5837	Complete
M6	Spark Plate	30-1235	
A7	Trimmer	31-6472	Ant. Adj.
	Dial Glass	54-5092	
	Knob	27-4687-14	Manual
	Knob	27-4687-11	Vol. & Tone (2)
	Knob	56-7556FA8	Volume

PUSHBUTTON ADJUSTMENTS

Since the pushbuttons are mechanical, any button may be adjusted to any station within the receivers tuning range.

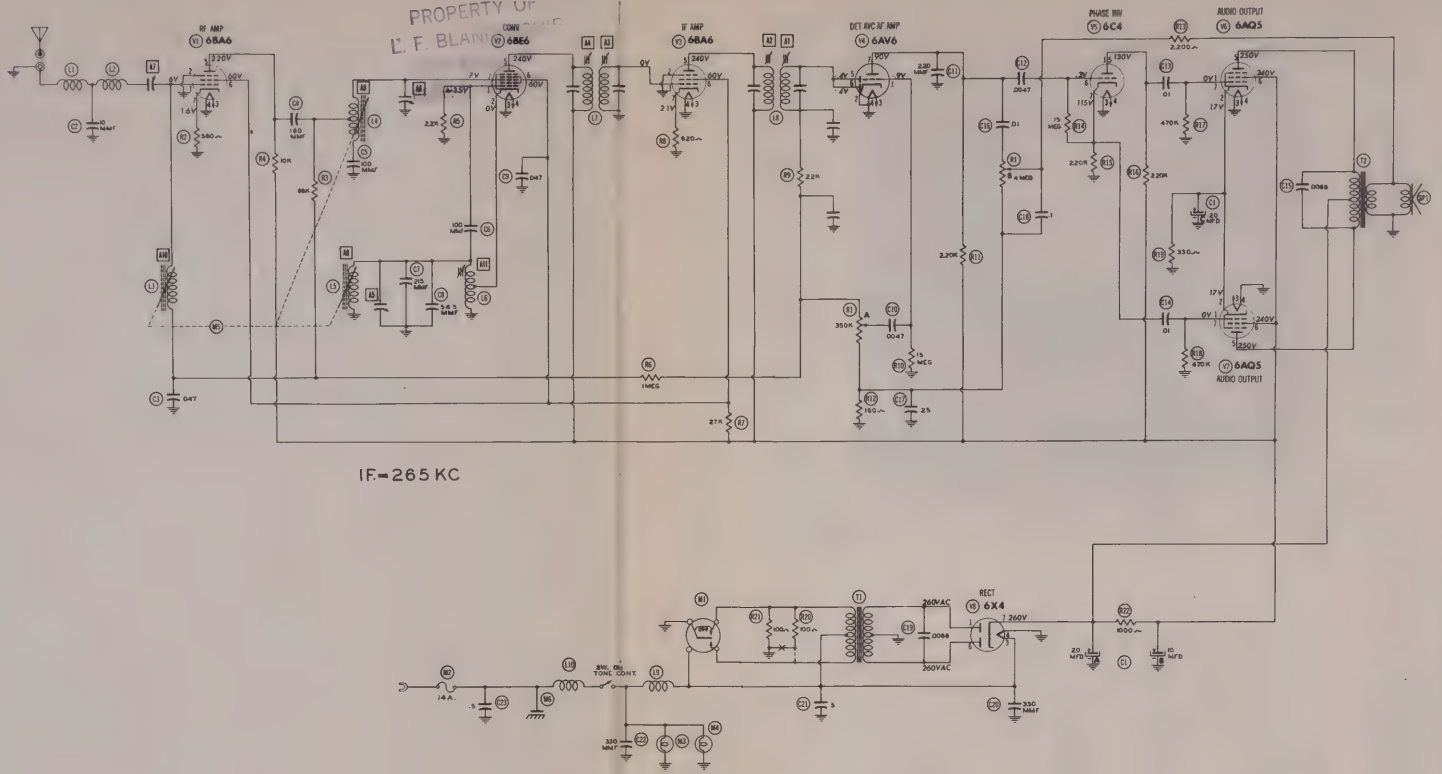
Carefully tune in the desired station manually

With your fingers loosen the button by turning approximately one turn counter clockwise.

Press the button all the way in, and then release it.

Tighten the button finger tight.

PROPERTY OF
L. F. BLAIN



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	1.3Meg	0Ω	.2Ω	0Ω	†11KΩ	†28KΩ	560Ω
V 2	6BE6	22KΩ	.9Ω	0Ω	.2Ω	†1KΩ	†28KΩ	1.4Meg
V 3	6BA6	49Ω	0Ω	.2Ω	0Ω	†1KΩ	†28KΩ	820Ω
V 4	6AV6	15Meg	0Ω	0Ω	.2Ω	370KΩ	370KΩ	†220KΩ
V 5	6C4	†220KΩ	INF	0Ω	.2Ω	†220KΩ	15Meg	220KΩ
V 6	6AQ5	470KΩ	330Ω	0Ω	.2Ω	†245Ω	†1KΩ	470KΩ
V 7	6AQ5	470KΩ	330Ω	.2Ω	0Ω	†245Ω	†1KΩ	470KΩ
V 8	6X4	400Ω	INF	.2Ω	0Ω	INF	425Ω	60KΩ

† MEASURED FROM PIN 7 OF V8
▲ TAKEN WITH VACUUM TUBE VOLTMETER

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLO.

V-M
MODEL 985

TRADE NAME	V-M Model 985		
MANUFACTURER	V-M Corp, Benton Harbor, Mich.		
TYPE SET	AC Operated Audio Amplifier With 3 Speed Automatic Record Changer		
TUBES (Three)	Types 12SQ7 AF Amp., 50L6 Audio Output, 35Z5GT Rectifier		
POWER SUPPLY	110-120 Volts AC	RATING	.22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHARGER UNIT MODEL 950 - SEE PHOTOFACT SET #107 - FOLDER #13 OR RECORD CHANGER MANUAL CM-3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		V. M. PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12SQ7	12SQ7	8Q	
V2	Audio Output	50L6	50L6	7AC	
V3	Rectifier	35Z5	35Z5	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	V. M. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	60	150	3832	PRS150/50-30-20		EDL42215 BR205A		TVL-3444 TVA-1306	Filter (Red) Filter (Green) Output Cathode (Yellow)
B	20	150							
C	20	50							
C2	.003	600	2850	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Audio Coupling
C3A	.01		♦3614		♦PC-81				Audio Coupling
B	250								AF Amp. Plate
C									Audio Output Grid
C4	.003	600	2850	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Tone Comp.
C5	.08	400	2894						Line Isolation

♦ Items C3A, C3B, C3C, R5A, R5B are combined in one unit.
When replacing with separate components, C3B and C3C should total 250 MMF.

CONTROLS

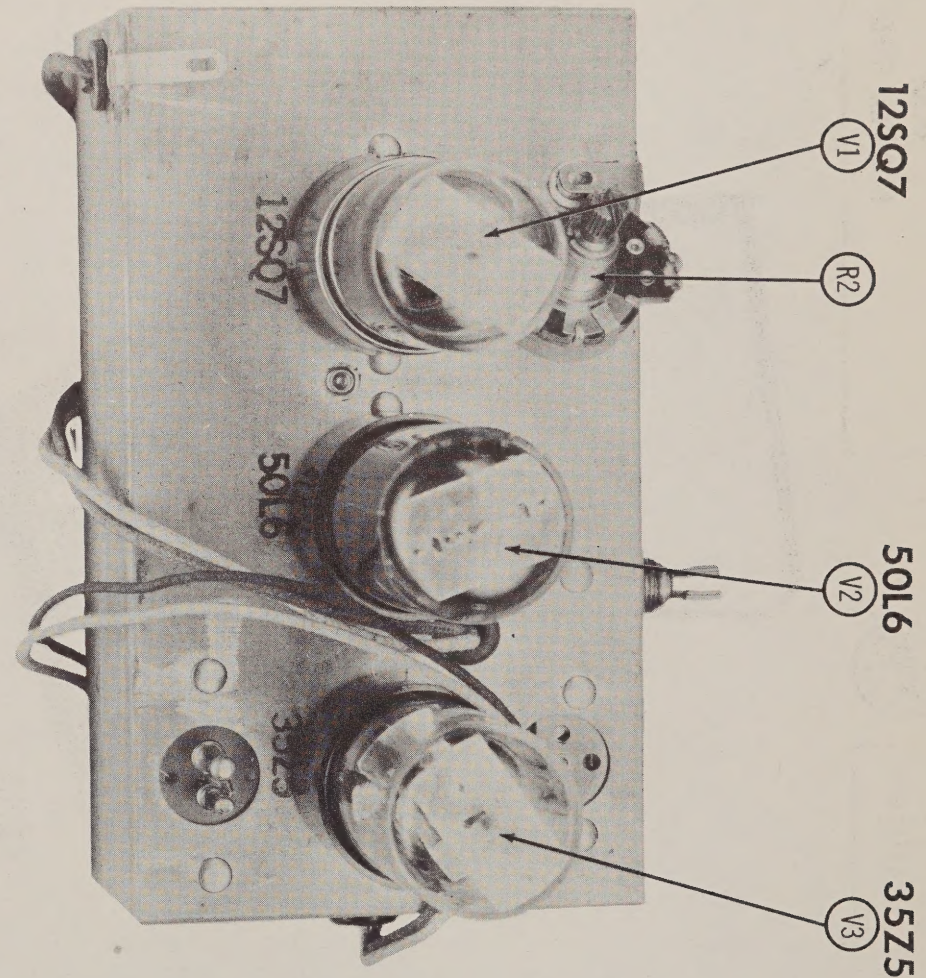
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	V. M. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO:	
R1A	2Meg	½	4128	Q13-139	AG-66-Z	AN-76	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions
R2A	500KΩ	½	4127	Q13-133	AG-60-Z	BSK-60	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	V. M. PART No.	IRC PART No.	
R3	560KΩ	½		BTS-560K	Tone Compensation - See Note 1.
R4	5.6 Meg	½		BTS-5.6 Meg	AF Amp Grid - See Note 2.
R5A	250KΩ	½	♦3614		AF Amp Plate
B	500KΩ	½			Output Grid
R6	180Ω	½		BTS-180	Output Cathode - See Note 3
R7	4700Ω	½	2855	BTS-4700	Filter
R8	33Ω	½	2893		Surge Limiter
R9	150Ω	10	2843	1 3/4A-150	Filament Dropping

Note 1. Some models use a 470KΩ resistor in this application.
Note 2. Some models use a 4.7 Meg resistor in this application.
Note 3. Some models use a 150Ω resistor in this application.
Note ♦. Items R5A, R5B, C3A, C3B, C3C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		V. M. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2KΩ	3.4Ω	160Ω	.5Ω	Part of 4224	A-3332①	A-3025①		① Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	V. M. PART No.	VIKING PART No.	QUAM PART No.	
SP1A	P. M.	3.4Ω	4224	46J6	46A1	
	CONE DIA.	V. C. DIA.				
SP1B	6" x 4"	9/16"				

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	V-M PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A62A A65MG	96-T	0-1 or S-1 & 0-3 or S-3	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

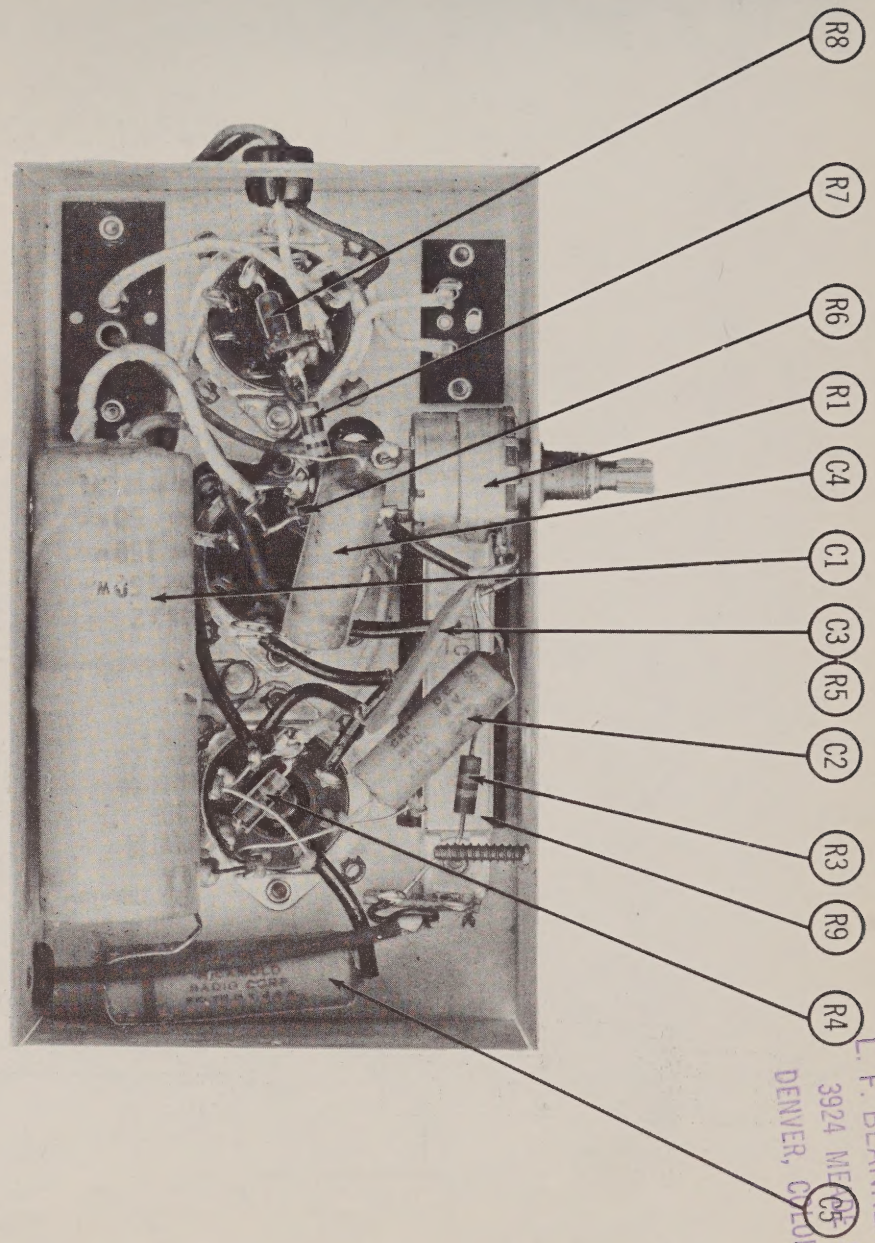
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	V-M PART No.	WALCO PART No.	JENSEN PART NO.	
M2		W-30A and W-30MGS	JP-30 and JPS-30LP	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M3	Lazy Light		Type #47

CHASSIS—BOTTOM VIEW



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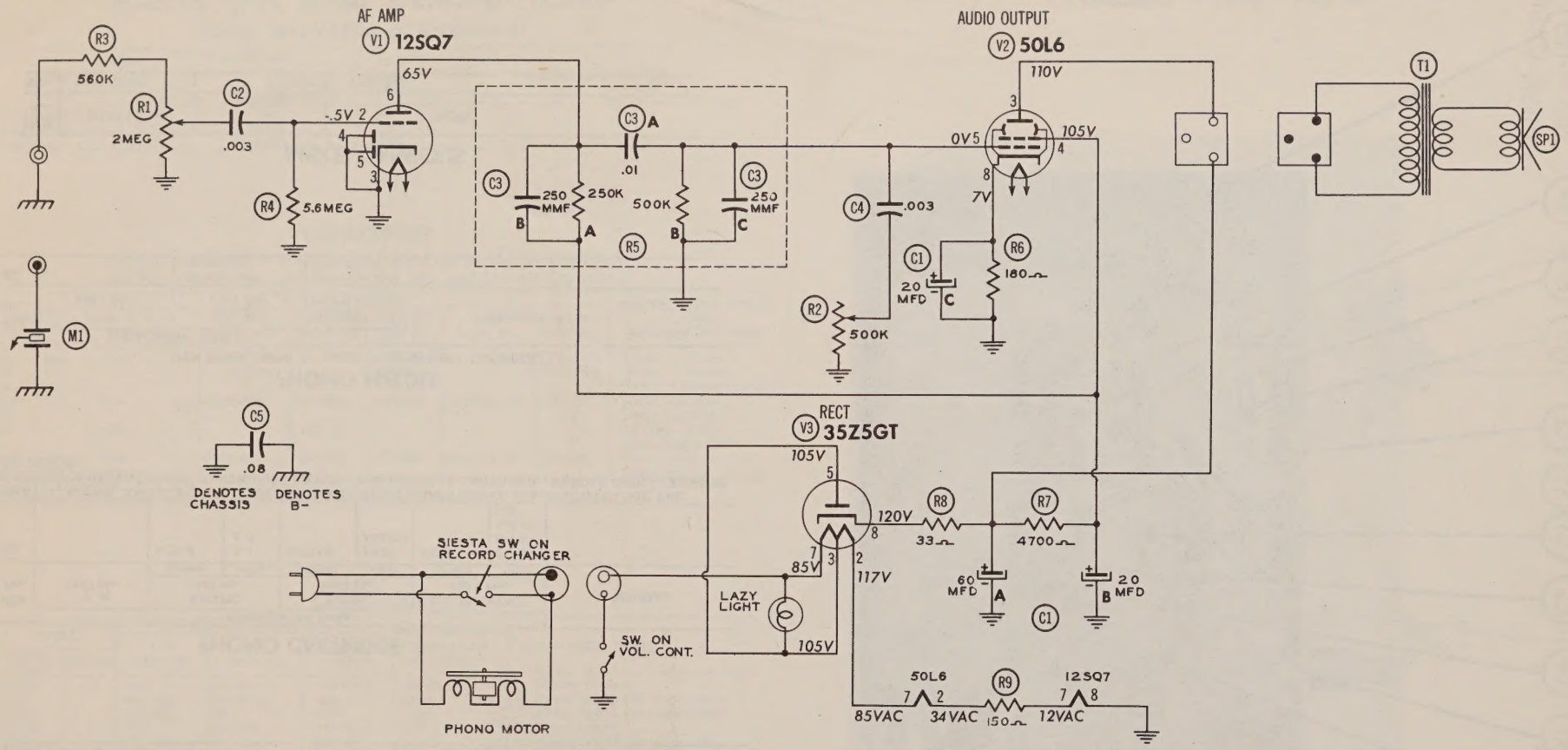

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SQ7GT	INF	4.7Meg	0Ω	0Ω	0Ω	†250KΩ	12Ω	0Ω
V 2	50L6GT	INF	162Ω	†195Ω	†4.7KΩ	500KΩ	INF	112Ω	150 Ω
V 3	35Z5GT	INF	147Ω	129Ω	†33Ω	129Ω	INF	112Ω	45KΩ

†MEASURED FROM PIN 8 of V3

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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166-16

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Proper output load connected.